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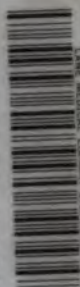
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SYSTEM OF
PHYSIOLOGIC THERAPEUTICS

VOLUME IV

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Descriptive Circular upon Application

A SYSTEM
OF
PHYSIOLOGIC THERAPEUTICS

A PRACTICAL EXPOSITION OF THE METHODS, OTHER THAN DRUG-
GIVING, USEFUL IN THE PREVENTION OF DISEASE AND
IN THE TREATMENT OF THE SICK

EDITED BY

SOLOMON SOLIS COHEN, A.M., M.D.

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AND TO THE RUSH HOSPITAL FOR CONSUMPTION; CONSULTING PHYSI-
CIAN TO THE JEWISH HOSPITAL, ETC.

VOLUME IV

Climatology
Health Resorts—Mineral Springs

BY

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WITH THE COLLABORATION FOR AMERICA OF

GUY HINSDALE, A.M., M.D.

SECRETARY OF THE AMERICAN CLIMATOLOGICAL ASSOCIATION; PRESIDENT OF THE PENNSYLVANIA
SOCIETY FOR THE PREVENTION OF TUBERCULOSIS; FORMERLY LECTURER ON MEDICAL
CLIMATOLOGY IN THE UNIVERSITY OF PENNSYLVANIA

IN TWO BOOKS

BOOK II

HEALTH RESORTS OF AFRICA, ASIA, AUSTRALASIA, AND AMERICA

SPECIAL THERAPEUTICS

WITH A SPECIAL ARTICLE ON THE HAWAIIAN ISLANDS BY DR. TITUS MUNSON COAN, OF NEW YORK

Illustrated with Maps

PHILADELPHIA
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EDITOR'S PREFACE

In this book will be found what is believed to be, on the whole, the most nearly complete account of the health resorts of the United States yet published. In its preparation free use has been made of the Bulletins of the United States Weather Bureau, and the United States Geological Survey,—especially the excellent Report on the Mineral Springs of the United States, by Dr. A. C. Peale,—of official publications of various States, of books and journal articles by many authors, of the valuable publications of the American Climatological Association, and of like sources of information; also private correspondence and oral communications have been laid under contribution; for all of which grateful acknowledgment is here made. Attention has likewise been given, as in Book I, to the many elements, other than physical or chemical ones, that help to constitute the availability of various stations as health resorts or as places of permanent residence. Much difficulty has attended the endeavor to make the compilation accurate. In many cases trustworthy data upon important subjects were not to be obtained; in other cases, personal observations alone were available. Both Dr. Hinsdale and the editor will therefore be glad to have their attention called to any errors of omission or of commission that may have occurred, and to receive descriptions of desirable resorts not mentioned in these pages. The natural advantages of the American continent, and of that large portion of it included in the United States, for climatic and mineral water health stations are not less than those of the Old World; but the systematic development of these advantages has scarcely begun. American physicians should turn their attention to the subject more strongly, and should endeavor to interest their enterprising neighbors in the business aspects of the matter. Information bearing upon the particular climatic features and climatotherapeutic or

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balneotherapeutic merits of places having as yet only a local reputation should be more widely disseminated, and the organization of facilities for the care of invalids should be more methodic. The American Climatological Association has made a good beginning of the work, but much remains to be done by individual physicians, and chiefly by those at or near the resorts that are to be organized and developed.

Special attention is called to the chapter on the Climate of Hawaii, a topic on which Dr. Coan's long residence in the islands enables him to speak with authority, and of which no other equally adequate discussion is to be found. For this reason a proportionably large amount of detail and of theoretic discussion has been given to the subject, one that is now of particular interest to Americans. Dr. Luis P. Jimenez, of Costa Rica, has kindly revised the chapter on Central America.

In Part III the reader will find a careful consideration of the objects to be sought by climatic treatment in special morbid conditions, and for special classes of patients, and a description of the types of climatic resorts at which those objects may be attained. The particular places mentioned under the various headings are illustrative, and must not be considered to exhaust the list of available stations. The citations, nevertheless, are meant to be suggestive, and to aid the physician in the definite prescription of a therapeutic means too often applied in a haphazard fashion. They are to be considered together with the descriptions of the places cited, which are given in Part II.

Book I of this work was in the binder's hands, and the greater part of Book II had been plated, before the torrid wave of the present summer swept over the earth. The records of extreme temperatures at some points may therefore fall short, by one or two points, of the latest manifestations, but the general accuracy of the climatic descriptions is not affected.

The indices to both books, the excellence of which the reader will doubtless appreciate, have been prepared by a friend who does not desire mention by name. The climatic maps are by Dr. W. F. R. Phillips, of the United States Weather Bureau.

CONTENTS

PART II—DESCRIPTION OF HEALTH RESORTS —(Continued)

	PAGE
CHAPTER XI	
THE HEALTH RESORTS OF AFRICA,	17-30
Egypt—Upper Egypt. The Nile Voyage. Egyptian Climatic Features.	
Therapeutic Indications. South Africa—The Climates of South Africa.	
CHAPTER XII	
ASIA,	31-37
The Hill Climates of the Indian Empire. The Himalayan Stations.	
The Bombay Presidency. The Nilgiri Hills. Other Indian Resorts.	
CHAPTER XIII	
ISLAND RESORTS OF THE PACIFIC,	38-49
Australasia—Australia. Tasmania. New Zealand. The Auckland	
Islands. Polynesia and the Tropic Islands of the Pacific—The Society	
Islands. The Friendly Islands. The Fiji Islands. The Sandwich	
Islands. The Philippine Islands.	
CHAPTER XIV	
HEALTH RESORTS OF SOUTH AMERICA,	50-61
The Andes. Chile. The Argentine Republic. Bolivia. Peru. Brazil.	
Ecuador. Colombia.	
CHAPTER XV	
CENTRAL AMERICA, THE WEST INDIES, AND BERMUDA,	62-76
The Isthmus of Panama. Costa Rica. Nicaragua. Honduras. San	
Salvador. Guatemala. The Greater Antilles, or Leeward Islands—	
Jamaica. Cuba. The Isle of Pines. Puerto Rico. Haiti. The	
Bahama Islands. The Lesser Antilles, or Windward Islands—Trini-	
dad. Barbados. Other Islands of the Windward Group—St. Lucia.	
St. Kitts. Antigua. Guadaloupe. Dominica. Martinique. The Ber-	
muda Islands.	
CHAPTER XVI	
CLASSIFICATION OF THE CLIMATES OF CANADA, THE UNITED STATES,	
MEXICO, AND NEIGHBORING ISLANDS,	77-79
Marine Climates. Coast Climates. Inland Climates of Low, Moderate,	
and High Elevations. Available Mountain Stations.	
CHAPTER XVII	
HEALTH RESORTS IN THE DOMINION OF CANADA,	80-85
General Features of Canadian Climates. Health Stations in Canada.	
The Adjoining Canadian Provinces—Cape Breton. Nova Scotia. New-	
foundland. Prince Edward Island. British Columbia and Alberta.	
CHAPTER XVIII	
THE RESORTS OF THE UNITED STATES OF AMERICA—THE NEW ENGLAND	
STATES,	86-99
Maine and the Islands off the Coast. The Coast of New Hampshire and	
the Neighboring Island Resorts. Massachusetts and the Adjacent Coast	
Resorts. Rhode Island and Narragansett Bay. Interior Resorts of	
Maine, New Hampshire, Vermont, Massachusetts, and Connecticut.	

CHAPTER XVIII—(Continued)		PAGE
CERTAIN COAST RESORTS OF THE UNITED STATES OF AMERICA—THE MIDDLE ATLANTIC STATES,	Resorts on Long Island, in New York Harbor, and on the Coast of New Jersey, Delaware, and Virginia.	100-108
CHAPTER XIX		
CERTAIN INLAND RESORTS OF THE UNITED STATES OF AMERICA—THE STATE OF NEW YORK,	The Adirondack Region. The Catskill Mountains. The Hudson River Region. Other Resorts in New York.	109-118
CHAPTER XX		
THE RESORTS OF THE UNITED STATES OF AMERICA—INLAND STATIONS IN THE MIDDLE STATES (Continued),	New Jersey. Pennsylvania. Maryland. The District of Columbia.	119-127
CHAPTER XXI		
THE RESORTS OF THE UNITED STATES OF AMERICA—THE SOUTHERN ATLANTIC STATES,	The Interior Resorts of Virginia, West Virginia, North Carolina, South Carolina, and Georgia.	128-141
CHAPTER XXII		
SOUTHERN COAST RESORTS OF THE UNITED STATES OF AMERICA,	South Carolina. Georgia. Florida. Mississippi. Louisiana. Texas.	142-151
CHAPTER XXIII		
THE RESORTS OF THE UNITED STATES OF AMERICA—SOUTHWESTERN STATES,	Alabama. Tennessee. Missouri. Arkansas. Kansas. Nebraska. Kentucky.	152-156
CHAPTER XXIV		
THE RESORTS OF THE UNITED STATES OF AMERICA—THE NORTH CENTRAL STATES,	Ohio. Indiana. Illinois. Michigan. Wisconsin. Minnesota. Iowa. South and North Dakota.	157-166
CHAPTER XXV		
THE RESORTS OF THE UNITED STATES OF AMERICA—THE ROCKY MOUNTAIN REGION,	General Physical Characteristics. Mountain Fever. New Mexico. Colorado. Idaho. Arizona. Wyoming. Indian Territory and Oklahoma. Montana. Utah. Nevada.	167-187
CHAPTER XXVI		
THE RESORTS OF THE UNITED STATES OF AMERICA—THE PACIFIC SLOPE —CALIFORNIA, OREGON, AND WASHINGTON,	The Pacific Coast of the United States. California. Oregon. Washington.	188-201
CHAPTER XXVII		
TOWNS OF THE UNITED STATES,	General Considerations. Boston. New York. Philadelphia. Washington. Chicago. St. Louis. New Orleans. San Francisco. University Towns.	202-218
CHAPTER XXVIII		
THE REPUBLIC OF MEXICO,	General Climatic Features. The Plateau of Anahuac. The City of Mexico. Zacatecas, Silao, Monterey, Saltillo, Durango, Vera Cruz.	219-222

CHAPTER XXIX

THE HAWAIIAN ISLANDS,	PAGE 223-241
The Climate of Hawaii. Geography. Orography. Temperatures. Winds. Rainfall. Disease and Mortality. Resorts and Places of Resi- dence. Therapeutic Indications.	

PART III—CLIMATOTHERAPEUTICS

SECTION I—GENERAL MANAGEMENT OF PATIENTS AT
HEALTH RESORTS

CHAPTER I

THE THERAPEUTIC EMPLOYMENT OF CLIMATES, HEALTH RESORTS, AND SANATORIUMS,	245-259
Change. Rest and Recreation. Exercise and Mechanotherapeutics. Diet, Milk Cures, Grape Cures, etc. Mineral Waters, Baths, and Hydrotherapeutic Treatment. Sea bathing. Clothing. Medical Super- vision, etc. Sanatorium Treatment.	

CHAPTER II

THE SELECTION OF HEALTH RESORTS,	260-266
Constitution of the Patient. Journey to the Health Resort. The Season of the Year. The Expense of Treatment. The Inclinations of the Patient. Opportunities for Open-air Treatment. Selection of Dwellings.	

SECTION II—SPECIAL THERAPEUTICS

CHAPTER III

CONVALESCENCE, DEBILITY, AND HEMIC DISORDERS,	267-278
Convalescence from Acute Diseases. Anemia and General Debility— Chlorosis.	

CHAPTER IV

THE USE OF HEALTH RESORTS IN CERTAIN DIATHESES AND TOXEMIAS,	279-285
Rachitic and Weakly Children. Syphilis. Chronic Metallic Poisoning. Gout and Gouty Conditions.	

CHAPTER V

THE USE OF HEALTH RESORTS IN RHEUMATISM AND ALLIED AFFEC- TIONS,	286-290
Articular Rheumatism. Gonorrheal Rheumatism and other Pseudorheu- matic Affections of the Joints and Fasciæ. Chronic Rheumatoid Arthritis. Chronic or Progressive Arthritis Ossificans.	

CHAPTER VI

SOME DISORDERS OF METABOLISM,	291-296
Obesity. Diabetes Mellitus and Glycosuria—the Grave Forms; the Mild Forms.	

CHAPTER VII

CHRONIC MALARIAL AFFECTIONS AND CACHECTIC CONDITIONS FROM LONG RESIDENCE IN HOT CLIMATES,	297-298
Chronic Malarial Affections. Malarial and Tropic Anemia.	

CHAPTER VIII

THE INFLUENCE OF CLIMATE IN THE VARIOUS PERIODS OF LIFE,	299-302
The Climacteric Period in Women. Old Age and Premature Old Age.	

CHAPTER IX		PAGE
TUBERCULOSIS AND TUBERCULOUS AFFECTIONS,		303-326
Pulmonary Tuberculosis. The Selection of Climates. High Altitudes. Sea Voyages. The Desert Climate of Egypt. Mineral Water Health Resorts. Sanatoriums. Scrofula and Chronic Tuberculous Affections other than Pulmonary Tuberculosis.		
CHAPTER X		
DISEASES OF THE RESPIRATORY ORGANS OTHER THAN TUBERCULOSIS, . .		327-335
Chronic Catarrh of the Pharynx, Larynx, and Nose. Chronic Bronchitis and Pulmonary Emphysema. Bronchiectasis. Remnants of Pleurisy and Pleuritic Effusion. Hay-fever. Asthma.		
CHAPTER XI		
DISEASES OF THE CIRCULATORY SYSTEM,		336-340
The Heart after Acute Rheumatism. The Heart after Influenza. Dila- tation and Hypertrophy of the Heart and Imperfect Compensation. Angina Pectoris and Myocardial Degeneration. Fatty Infiltration of the Heart. Senile Changes in the Heart. Palpitation and other Functional Disorders of the Heart.		
CHAPTER XII		
DISEASES AND DISORDERS OF THE DIGESTIVE APPARATUS,		341-352
Chronic Digestive Disorders. Dyspepsia. Habitual Constipation. Chronic Diarrhea. Hemorrhoids, Chronic Catarrh of the Rectum, and Pruritus Ani. Affections of the Liver and Bile-ducts. Congestion and Enlargement of the Liver. Cholelithiasis.		
CHAPTER XIII		
DISEASES OF THE URINARY ORGANS,		353-359
Chronic Nephritis. Paroxysmal Hemoglobinuria. Urinary Gravel. Oxaluria. Phosphaturia. Calculi in the Kidneys and Bladder. Chronic Pyelitis and Chronic Catarrh of the Urinary Bladder. Chronic Urethritis and the Remains of Gonorrhea.		
CHAPTER XIV		
DISORDERS OF THE SEXUAL SYSTEM,		360-363
Disorders of the Sexual System in Men. Disorders of the Sexual System in Women.		
CHAPTER XV		
DISEASES OF THE NERVOUS SYSTEM,		364-380
Epilepsy. Hysteria. Hypochondriasis. Mental Depression. Neuras- thenia. General Paralysis. Tabes Dorsalis. Neuritis and Neuralgias. Backache. Graves's Disease. Goiter. Myxedema. Diabetes Insip- idus. Spasmodic Asthma. Chronic or Recurrent Headaches. Disorders of Sleep.		
CHAPTER XVI		
AFFECTIONS OF THE EYES, EARS, AND SKIN,		381-387
Affections of the Eyes. Affections of the Ears. Affections of the Skin.		
<hr/>		
INDEX,		389
LIST OF ILLUSTRATIONS,		xi
CONVERSION TABLES OF TEMPERATURES, HEIGHTS, AND DISTANCES, . . .		xiii



LIST OF ILLUSTRATIONS

PLATE	PAGE
I. Map of Africa; Annual Rainfall (inches) (<i>Colored</i>),	Preceding 17
II. Map of Africa; Areas Enclosed in Red, Altitude of 3000 Feet or Above (<i>Colored</i>),	Opposite 18
III. Map of India; Annual Rainfall (inches) (<i>Colored</i>),	Opposite 32
IV. Map of India; Areas Enclosed in Red, Altitude of 3000 Feet or Above (<i>Colored</i>),	Precedes 33
V. Map of Australia; Areas Enclosed in Red, Altitude of 3000 Feet or Above (<i>Colored</i>),	Opposite 38
VI. Map of Australia; Annual Rainfall (inches) (<i>Colored</i>),	Opposite 40
VII. Map of South America; Areas Enclosed in Red, Altitude of 3000 Feet or Above (<i>Colored</i>),	Opposite 50
VIII. Map of North America; Areas Enclosed in Red, Altitude of 3000 Feet or Above (<i>Colored</i>),	Opposite 78
Monthly Means of Temperature, Pressure, Humidity, and Wind at Denver and New York, Compared,	175
IX. Map of Hawaiian Islands; Annual Rainfall (inches) (<i>Colored</i>),	Opposite 224
X. Map of United States; Annual Deaths in the Various States from Pulmonary Tuberculosis (<i>Colored</i>),	Opposite 314
XI. Map of United States; Areas Enclosed in Red, Altitude of 3000 Feet or Above (<i>Colored</i>),	Opposite 316
XII. Diagrams of Altitudes in United States; shown by cross-sections at latitudes of Boston, Philadelphia, and Santa Fé (New Mexico),	Opposite 318

CONVERSION TABLES

In the text of this volume temperatures are expressed in degrees Fahrenheit, altitudes in English feet, and distances in English miles, but the following conversion tables may be found useful :

Temperatures: CEN- TIGRADE AND FAHREN- HEIT DEGREES.		TEMPERATURES: CEN- TIGRADE AND FAHREN- HEIT DEGREES.		TEMPERATURES: CEN- TIGRADE AND FAHREN- HEIT DEGREES.		HEIGHTS: METERS AND ENGLISH FEET.	
Cent.	Fah't.	Cent.	Fah't.	Cent.	Fah't.	Meters.	Feet.
100	212	44	111.2	-12	10.4	9	29.5
99	210.2	43	109.4	-13	8.6	10	32.8
98	208.4	42	107.6	-14	6.8	20	65.6
97	206.6	41	105.8	-15	5	30	98.4
96	204.8	40	104	-16	3.2	40	131.2
95	203	39	102.2	-17	1.4	50	164
94	201.2	38	100.4	-18	-0.4	60	196.8
93	199.4	37	98.6	-19	-2.2	70	229.6
92	197.6	36	96.8	-20	-4	80	262.4
91	195.8	35	95	-21	-5.8	90	295.2
90	194	34	93.2	-22	-7.6	100	328
89	192.2	33	91.4	-23	-9.4	200	656.1
88	190.4	32	89.6	-24	-11.2	300	984.2
87	188.6	31	87.8	-25	-13	400	1,312.3
86	186.8	30	86	-26	-14.8	500	1,640.4
85	185	29	84.2	-27	-16.6	600	1,968.5
84	183.2	28	82.4	-28	-18.4	700	2,296.6
83	181.4	27	80.6	-29	-20.2	800	2,624.7
82	179.6	26	78.8	-30	-22	900	2,952.8
81	177.8	25	77	-31	-23.8	1000	3,280.8
80	176	24	75.2	-32	-25.6	2000	6,561.7
79	174.2	23	73.4	-33	-27.4	3000	9,842.6
78	172.4	22	71.6	-34	-29.2	4000	13,123.5
77	170.6	21	69.8	-35	-31	5000	16,404.4
76	168.8	20	68	-36	-32.8		
75	167	19	66.2	-37	-34.6		
74	165.2	18	64.4	-38	-36.4		
73	163.4	17	62.6	-39	-38.2		
72	161.6	16	60.8	-40	-40		
71	159.8	15	59	-41	-41.8		
70	158	14	57.2	-42	-43.6		
69	156.2	13	55.4	-43	-45.4		
68	154.4	12	53.6	-44	-47.2		
67	152.6	11	51.8	-45	-49		
66	150.8	10	50	-46	-50.8		
65	149	9	48.2	-47	-52.6		
64	147.2	8	46.4	-48	-54.4		
63	145.4	7	44.6	-49	-56.2		
62	143.6	6	42.8				
61	141.8	5	41				
60	140	4	39.2				
59	138.2	3	37.4				
58	136.4	2	35.6				
57	134.6	1	33.8				
56	132.8	Zero	32				
55	131	-1	30.2				
54	129.2	-2	28.4				
53	127.4	-3	26.6				
52	125.6	-4	24.8				
51	123.8	-5	23				
50	122	-6	21.2				
49	120.2	-7	19.4				
48	118.4	-8	17.6				
47	116.6	-9	15.8				
46	114.8	-10	14				
45	113	-11	12.2				

Distances: KILO- METERS AND ENGLISH MILES.	
Kilometers.	Miles.
1	0.6
2	1.2
3	1.8
4	2.4
5	3.1
6	3.7
7	4.3
8	4.9
9	5.5
10	6.2
20	12.4
30	18.6
40	24.8
50	31
60	37.2
70	43.4
80	49.7
90	55.9
100	62.1
200	124.2

Heights: METERS AND ENGLISH FEET.	
Meters.	Feet.
1	3.2
2	6.5
3	9.8
4	13.1
5	16.4
6	19.6
7	22.9
8	26.2

NOTE.—The higher temperatures are given because mineral waters are frequently mentioned in the present volume. The temperature of some thermal springs is close to or actually that of boiling water.



A SYSTEM OF PHYSIOLOGIC THERAPEUTICS

CLIMATOTHERAPY—BOOK II

PART II (Continued)

DESCRIPTION OF HEALTH RESORTS





CLIMATOTHERAPY

PART II (Continued)

DESCRIPTION OF HEALTH RESORTS

CHAPTER XI

THE HEALTH RESORTS OF AFRICA

Egypt—Upper Egypt. The Nile Voyage. Egyptian Climatic Features. Therapeutic Indications. South Africa—The Climates of South Africa.

EGYPT

The general characters of the **desert climate** have been described in Part I, and reference has been made to Alexandria and Ramleh among the Mediterranean localities. Cairo and its neighborhood (Mena House and Helouan) remain to be considered, as well as the Nile voyage and the health resorts of upper Egypt—Luxor and Assouan.

CAIRO, in latitude $30^{\circ} 2'$ north, has an altitude of about sixty feet. The mean annual temperature is 70.4° F.; the mean temperature for the four winter months, from December to March, 59° F.; the mean daily range of temperature, 25° F. The least daily variations of temperature occur in winter, sometimes amounting to only 9° or 7° F. The mean relative humidity is 61.2 per cent. Dr. Canney,¹

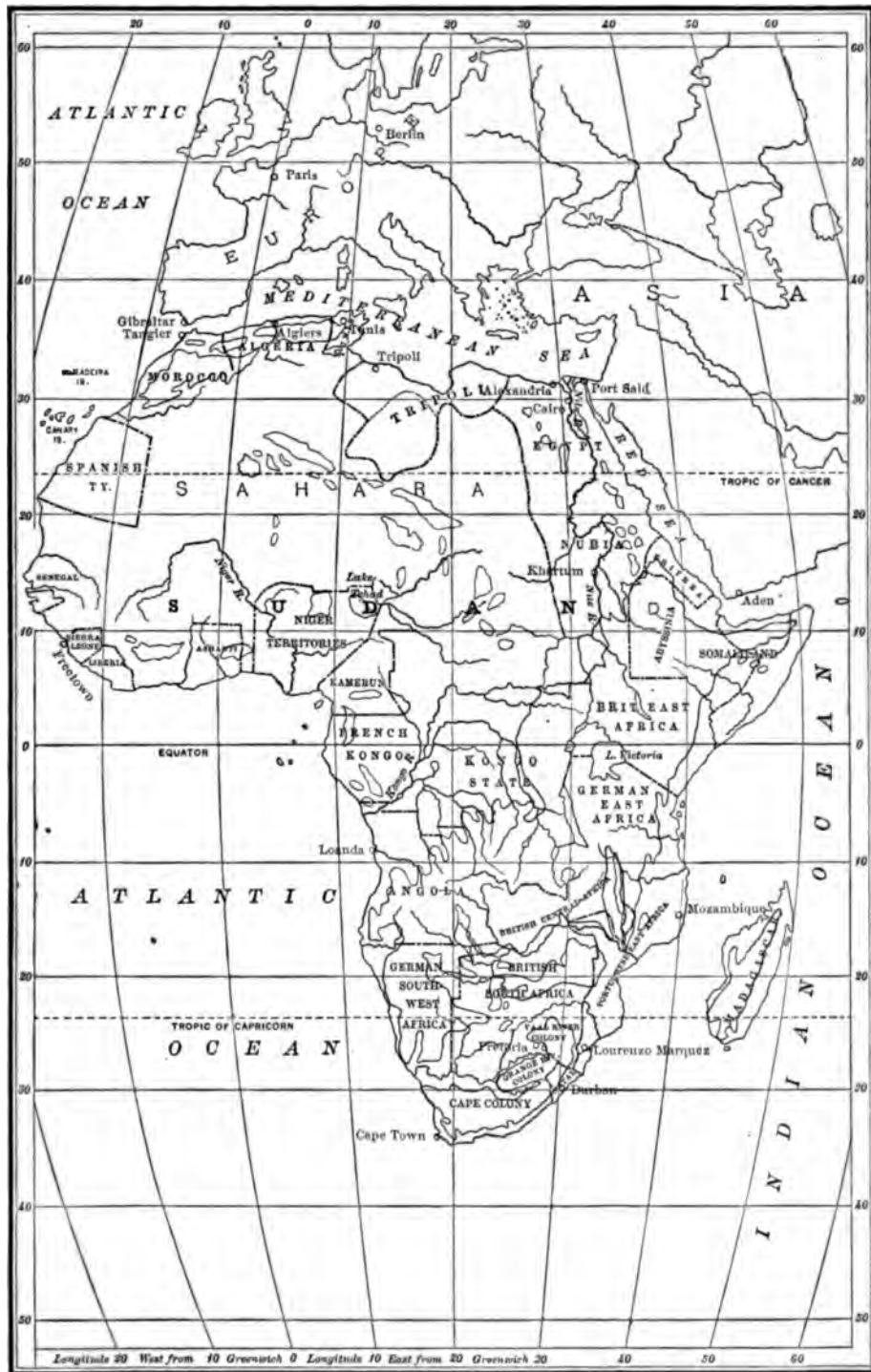
¹ "The Winter Meteorology of Egypt and its Influence on Disease," London, 1897.

from whom we have obtained most of the meteorologic data of Egyptian resorts, says that the stability of the temperature is very marked in winter and autumn, but in the spring rapid changes take place at irregular intervals, the temperature rising suddenly, only to fall again; this occurs especially during the period when the khamsin winds prevail—in March and April. The khamsin winds, described in Part I, blow from the south and southwest for from two to four days at a time. They bring excessive heat and marked dryness, with clouds of fine sand from the desert; the thermometer may rise to 100° F. or more, and the relative humidity may sink to 10 or even to 3 per cent. A khamsin may be followed abruptly by a northwest or west wind, with increase of relative humidity and fall of temperature. During a khamsin the daily variation in temperature may reach 42° or even 51° F. At Cairo the north wind is prevalent, and is almost the only wind that is felt from May to October. There are but about seventeen days in the year on which rain falls, nearly all occurring in winter and spring, and the total annual rainfall is about 1¼ inches.

Owing to the imperfect sanitation of the crowded town itself, Cairo is hardly suitable for real invalids, for whom, moreover, the social attractions and sight-seeing constitute a grave source of danger. According to Dr. Sandwith,¹ the water-supply is good during the winter, and is further improved by the prevalent use of Pasteur filters; typhoid fever is rare among the visitors to Cairo, but is almost always present among the English soldiers, who drink from polluted sources outside of the barracks. Cow's milk of good quality can be obtained from several dairies. For invalids with pulmonary or renal affections Assouan, Luxor, or Helouan will be suitable, but many of those who, although they have no serious illness, require a winter holiday with mental recreation in a warm sunny climate may spend the winter at Cairo. The season may be said to last from the middle of November to the middle of April. The hygienic arrangements of the hotels are, on the whole, satisfactory, but the expense of living is high. For those who prefer to reside outside the town, the Ghezireh Palace Hotel, three

¹ "British Medical Journal," October 3, 1896.

PLATE II.



W.F.B. Phillips.

Areas enclosed in red, altitude of 3000 ft. or above.

G.A. Peters & Son 1904, 1905

miles distant, or the Mena House Hotel, eight miles away, will be found convenient. Others may prefer to reside at Helouan, where the life is quieter and the expense lower.

The MENA HOUSE HOTEL, eight miles from Cairo, lies near the Great Pyramid, at the edge of the western desert, about from twenty to thirty feet above the cultivated land of the apex of the Nile delta. The mean temperature for the four winter months, from December to March, is 59.5° F.; the mean relative humidity for the same period is 51.7 per cent. The climate is similar to that of Cairo, but the air is, of course, purer. The best season for a sojourn at Mena House is from the end of January to the end of March. One can reside there from the beginning of December, but the Nile delta is not sufficiently dry to make December and the first half of January quite satisfactory.

HELOUAN, fifteen miles south of Cairo, from which it can be reached in about half an hour by train, lies in a sort of artificial oasis in the eastern desert, about two miles to the west of the cultivated land of the Nile valley, and 115 feet above it. The mean temperature for the four winter months is 60.5° F., slightly above that of Cairo, and the mean relative humidity for the same period is 42.7 per cent. The warm springs of Helouan were probably made use of at a very early period, but date their modern reputation only from 1868, when Ismail Pasha appointed a scientific commission to investigate them. According to Attfield's analysis (1896), the muriated sulphur waters (90° F.) contain five grams of sodium chlorid to a liter, and 0.09 gram of hydrogen sulphid—equal to more than sixty volumes of the gas in a thousand volumes of the water. There are, likewise, simple muriated and muriated chalybeate waters. The new complete thermal establishment, opened in 1899, was planned with great care by Dr. Page May; and its thorough equipment and efficient management add much to the value of this resort. Helouan has almost a desert climate, and can be employed from the middle of November to the middle of April. The baths probably assist greatly the action of the climate in **chronic joint affections, rheumatoid arthritis**, and similar diseases. The Grand Hotel and the recently established Tewfik Palace Hotel both afford excellent accommodation.

UPPER EGYPT

The localities of upper Egypt have a warmer and drier winter climate, with a greater daily range of temperature, than the neighborhood of Cairo; owing to the higher temperature, the season for invalids is somewhat shorter. Canney says the daily range of temperature is 5° or 6° F. greater in upper than in lower Egypt, and increases from December to April. LUXOR, the ancient Thebes, is situated 241 feet above sea-level, in latitude $25^{\circ} 39'$ north, 450 miles south of Cairo, on the right bank of the Nile. The mean temperature for the four winter months, December to March, is 63.8° F., and the mean relative humidity for the same period is 36.3 per cent. Rain is very rare—even much rarer than at Cairo. There is less wind than at Cairo and Assouan, and in December there may sometimes not be enough. As the center of a district of great archæologic interest, Luxor is thronged with excursionists. The place itself consists of the hotels and the unhygienic dwellings of the native population. Owing to the cultivated land about Luxor, the climate has not quite so marked a desert character as at Helouan and Assouan, and is less suited for some cases of rheumatism. The season for invalids lasts from the commencement of December to the middle of March.

ASSOUAN, the ancient Syene, whither Juvenal was banished in his old age, is, for the present at least, the southernmost health resort of Egypt, lying at latitude $24^{\circ} 5'$ north, on the north side of the first cataract, 583 miles by the Nile from Cairo. It is warmer and drier than Luxor, but more windy. The mean temperature for the four winter months, from December to March, is 68.3° F. The mean relative humidity for the same period is 30.5 per cent. The best season for invalids is about the same as at Luxor.

The Nile voyage can be made either on private vessels ('dahabiyahs') or on the passenger steamboats. Great care is required to avoid contracting colds while on these steamboats. The winds are often strong, and drafts can hardly be avoided; the temperature, both in sun and shade, of different parts of the ship may vary widely. On the other hand, passengers have the advantage of being accompanied by a physician. In making the voyage by dahabiyahs invalids can proceed more leisurely and better avoid

high winds, but the cost is greater and there is no physician at hand unless one has been specially engaged for the voyage.

Egyptian Climatic Features

The favorable features that these winter climates of Egypt have in common are : (1) Plenty of sunshine and a sky that is generally clear ; (2) a high average temperature, with considerable daily range ; (3) low relative humidity and very little rain ; (4) purity of air, at least in the sparsely settled districts. The **disadvantages** for climatotherapeutic purposes are : (1) The winds laden with dust, already alluded to ; (2) the short duration of the invalid's season ; (3) the long journey out and the sudden return to very different climates in spring ; (4) the difficulty of keeping serious cases sufficiently under medical supervision. Moreover, Sir H. Weber remarks that during his visits he has not found the weather in Egypt so constant and reliable as it has been reputed to be.

Therapeutic Indications

The cases of **pulmonary tuberculosis** sent to Egypt should not be acute or very far advanced ; the patients should be sufficiently strong to endure the journey, and should not be affected by laryngeal¹ or intestinal tuberculosis or by chronic diarrhea. With these exceptions, the following classes of cases may be benefited : (1) Those complicated by **albuminuria** ; (2) those complicated by **emphysema**, **bronchitis**, or **bronchiectasis**, with copious expectoration or with a tendency to repeated attacks of bronchitis. Many of the patients treated at the Riviera resorts would find Egypt equally well suited. Both on the Riviera and in Egypt invalids must be very careful not to expose themselves to chills, and at both groups of health resorts there is a tendency for the patients not to be sufficiently under medical control. The practice of sending sick people to health resorts without urging the necessity of seeking constant local medical guidance is strongly

¹ In cases of laryngeal tuberculosis the facilities afforded by a health resort for local treatment must be considered. Most cases of pulmonary tuberculosis in which the larynx is likewise affected are unfavorable cases. As to the effect of atmospheric dryness *per se* on the diseased larynx, there is some doubt. The editor believes it to be good.

to be deprecated. On the Riviera, special sanatoriums for the treatment of tuberculosis are coming into existence, and probably at some later day sanatoriums under medical supervision will be established in the actual desert near the health resorts of upper Egypt. Dr. Canney's meteorologic observations tend to show that the desert climate near Luxor has a smaller daily range of temperature, and a lower relative humidity than the climate of Luxor itself.

Among other classes of patients likely to derive benefit from Egyptian climates, are the following:

1. Those suffering with various forms of **albuminuria** and **chronic renal disease** or **convalescing from acute nephritis**.

2. Those having **chronic bronchitis** and **emphysema**, **bronchiectasis**, and **chronic catarrhal conditions of the respiratory passages**, with a tendency to repeated attacks of **catarrh**.

These two classes of cases must be regarded as unsuitable for the ordinary passenger steamboats of the Nile so long as no special arrangements are made for invalids.

3. Those **convalescing from acute pulmonary and other diseases**, especially individuals by whom cold and high elevations are not well borne.

4. Many of those suffering with **rheumatoid arthritis**, **chronic gout**, **sciatica**, and kindred diseases. In these cases the climate may greatly be assisted by the thermal baths and douches of Helouan.

5. The large class of persons who require only a warm sunny winter climate and mental recreation. This group includes a number of **chronic invalids of weak constitution**, who suffer in various ways if they attempt to pass the winter in cold climates; **old persons** and **prematurely old persons**; and many of those whose **mental depression**, **insomnia**, **mild glycosuria**, or **dyspepsia** is due to overwork, mental worry, and town life. In many of these cases the Nile voyage may be recommended, with or without medical supervision, according to special circumstances.

In all these cases the warm climate has, at least, the advantage of enabling the patient to spend much more time in the open air than he could in a colder country; in fact, a warm winter climate is

sometimes recommended in various morbid conditions merely in order that a modified 'open-air treatment' may be carried out. Persons with **dysentery**, or convalescent from dysentery, or with **chronic diarrhea**, or great tendency to diarrhea, should not be advised to visit Egypt.

On leaving Egypt, one of the Mediterranean resorts, such as Amalfi, Sorrento, Naples, the Riviera, or Corfu, may be visited in April and May. Such an intermediate station must be selected carefully, according to the special circumstances of the case. At Ramleh, near Alexandria, patients may remain until the end of May, but here, too, there is the danger of insufficient medical supervision for **consumptive patients**.

SOUTH AFRICA

South Africa is bordered by a zone of low-lying coast-land, from which, at a variable distance from the shore, the ground rises to the mountains and plateaus that constitute the elevated interior. The veldt, or table-land region of the interior, about from 2500 to 6000 feet above sea-level, has the character of an immense elevated undulating heath or prairie, with ranges of rocky hills and mountains at various parts. Winter is the rainy season at Cape Town and on the west and the southwest coast of Cape Colony, while the summer is the rainy season on the east coast. From the shores of Cape Colony the land rises by steps, so that it may roughly be divided into three successive plateaus or 'karoos.' The Great, or Central, Karoo, which has a mean elevation of about 3000 feet, is separated by the Nieuwveldt range of mountains from the Northern, or Upper, Karoo, which reaches northward to the Orange River and has an elevation of from 2700 to 6000 feet. The Southern Karoo forms a kind of intermediate step between the coast of Cape Colony and the Central Karoo.

THE CLIMATES OF SOUTH AFRICA

The inland climates of South Africa must be classed with those of **high altitudes**, and are characterized by low atmospheric pressure, great dryness, transparency and transclency of the atmosphere, little rainfall, much sunshine, wide daily range of temperature,

and comparative freedom from organic impurities in the air. The disadvantages for invalids are the great amount of dust, the winds, the heat and the absence of shade during summer, and the difficulty of securing proper accommodation and medical supervision of patients.

On the Central Karoo the heat during summer—that is, December, January, February—is said to reach 110° F. in the shade, but, owing to the dryness, the high temperature is felt less severely than it would be in moister climates, and the nights are cool. Dust- and thunder-storms are frequent during summer. January, the hottest month, is said to have a mean maximum temperature of 87° F., while July, the coldest month, has a mean minimum temperature of 36° F. The mean daily range of temperature is about 27° F. The mean annual rainfall averages from 9 to 18 inches. The winters are clear, sunny, and bracing, with cold nights and comparative stillness of the air.

The winter climate of the karoo is more suitable than the summer climate for the class of patients for whom the climate of South Africa is generally recommended. On the other hand, the winter corresponds to the summer in the northern hemisphere, a season at which most English persons prefer to be in Europe. Only the **hardier class of consumptive patients** should be advised to go to South Africa. The best adapted are early nonfebrile cases, in persons who have to earn their own living and are accustomed to roughing it more or less in regard to food and accommodation; especially persons of originally strong constitution who have become infected with pulmonary tuberculosis during some temporary depression of the health and under specially bad hygienic circumstances. Sanatorium treatment has, however, already been instituted at various places, and it is possible that in time more extended use will be made of the climate for cases of pulmonary tuberculosis.

Reference has already been made to the voyage to and from the cape, and it now remains to consider separately some of the more important of South African resorts.

CAPE TOWN, in latitude $33^{\circ} 56'$ south, is situated between Table Mountain and Table Bay, and cannot be regarded as a health resort.

The mean maximum temperature is 71.3° F.; the mean minimum temperature, 53.1° F. The mean relative humidity is 79 per cent. The mean annual rainfall is 25 inches, and there are 86 rainy days, occurring chiefly in May, June, and July—the winter season.¹ Cape Town itself is windy, the south and east winds prevailing, and dusty during summer, while winter is the rainy season, when mists as well as rain are not rare. The suburbs of Cape Town are less dusty and pleasanter, however, than the town itself, and during summer a stay in the neighborhood of Cape Town is preferable to a sojourn in the eastern parts of Cape Colony, where summer is the rainy season. Following are some of the places that may be grouped with Cape Town:

The neighborhood of SEA POINT, to the west of Table Bay, has the advantage of sea-breezes and offers good accommodation. During the rainy season—the winter—it is drier than the more wooded suburbs on the other side of Table Mountain.

In the vicinity of the suburban village of CLAREMONT is the **Claremont Sanatorium**, which is built on an elevation in the beautiful Claremont valley, on the suburban side of Table Mountain. It is about six miles from Cape Town, located on grounds of its own, part of which is covered by a forest of young fir trees. Among other pleasant wooded suburban villages, one of the most prominent is RONDEBOSCH, five miles from Cape Town. It contains some of the finest private residences.

WYNBERG, a village eight miles from Cape Town, is situated on the eastern side of Table Mountain, about 146 feet above sea-level. The mean maximum temperature for the hottest month does not exceed 80° F. Wynberg has the reputation of being a healthful place, and affords good accommodation and shelter from southeast winds.

KALK BAY, a seaside resort on the shore of False Bay, with a station on the railway between Cape Town and Simon's Town, is much frequented by the inhabitants of Cape Town during summer.

¹ For meteorologic data of South African localities the reader is referred to the excellent tables compiled for A. S. and G. G. Brown's "Guide to South Africa," to which we are indebted. The general references are, of course, to times of settled peace.

CALEDON is a pleasant village situated on the southern slopes of a range of mountains about 830 feet above sea-level, two hours distant by railway from Cape Town. The thermal springs have a temperature of 120° F., and are used by residents in South Africa for hot baths and douches in sciatica, lumbago, chronic gouty affections, and the like. According to Hahn's analysis, given by Dr. Daniell, the mineral water contains 0.03 per mille ferrous carbonate, together with a certain quantity of carbonic acid gas. The **Caledon Mineral Waters Sanatorium** is situated on the southern slope of the Swartberg Mountains, about eighty feet above the village. The mean annual temperature is 62.3° F. The mean annual rainfall is 20 inches.

CERES, at an altitude of 1493 feet, is a pleasant health resort, suitable for use as an intermediate station by those intending to visit the higher resorts of the karoo. The annual rainfall is 41 inches, and the number of rainy days is 68, chiefly occurring in the winter months. The summer months, from September to May, are the best for residence at Ceres.

GRAHAMSTOWN (33° 18' latitude south) lies in the eastern part of Cape Colony, about 100 miles by railway from Port Elizabeth. It is prettily situated amidst fertile country, at an elevation of 1772 feet above sea-level. The annual rainfall averages 29.9 inches. More rain falls during the summer than during the winter, and it is much more evenly distributed throughout the year than at Ceres in the West. The climate is moister and more equable than that of the karoo. The mean relative humidity is said to be 74 per cent. for summer and 77 per cent. for winter. Like Ceres, it may be used as an intermediate station between the coast and the elevated regions of the karoo.

BEAUFORT WEST, at an altitude of 2792 feet, at the southern foot of the Nieuwveldt Mountains, on the main-line railway, about half-way between Cape Town and Kimberley, has a climate resembling that of the Great Karoo in general. The average rainfall is said to be only 8 inches in the year. Symes Thompson found the appearance of the town more attractive than that of Cradock, which has almost the same altitude. He considered Beaufort West a good stopping-place on the way north. At the very base of the Nieuw-

veldt Mountains, 400 feet above the village of Beaufort West, stands the **Lemoenfontein Hotel**, which may serve as a sanatorium for invalids. **WAGENAARS KRAAL**, about thirty miles north of Beaufort West, has a more elevated position—4000 feet; it offers a certain amount of accommodation for invalids.

CRADOCK ($32^{\circ} 11'$ latitude south) lies at an altitude of 2856 feet, in the eastern part of the Great Karoo, 108 miles from the coast, on the main line between Port Elizabeth and Kimberley. The mean annual rainfall is 14.5 inches. Symes Thompson says that—“Although apt to be dusty during droughts, it has a good all-year-round climate. Its rainfall is small, occurring only in the form of summer thunder-storms. The humidity is 62 per cent.; the average summer maximum temperature is 91° F.”

TARKASTAD, at an altitude of 4300 feet, midway between Cradock and Queenstown, is situated in an open, fertile region fifty-two miles from Cradock. Its climate has been commended by Symes Thompson, because, unlike many other health resorts, Tarkastad is not shut in by hills, and has constant breezes to cool the air. The air is very dry, and the annual rainfall is said to be but 9 inches.

BURGHERSDORP, at an altitude of 4554 feet, with a station on the Eastern Railway between East London and Bloemfontein, is the chief town of the eastern portion of the Upper Karoo. The annual rainfall is 11 inches. It has been recommended by Dr. Kannemeyer specially on the ground that it is within easy access of places 1000 feet higher and 1000 feet lower, thus affording the opportunity of readily changing the climate at different times of year. According to Kannemeyer, the summer days are disagreeably hot and the midwinter nights cold, but during the remainder of the year the weather is temperate and delightful.¹

ALIWAL NORTH, situated at latitude $30^{\circ} 43'$ south, with a station on the Eastern Railway, lies on the Orange River, at an altitude of 4330 feet above sea-level, in the eastern part of the Northern Karoo. The mean annual rainfall is 22.6 inches. The mean rela-

¹ *Vide* “South Africa as a Health Resort,” by Dr. E. Symes Thompson. Read before the Royal Colonial Institute and printed in the second edition of Fuller’s “South Africa,” London, 1889.

tive humidity is about 61.5 per cent. It has a good karoo climate, and has been referred to by Dr. Symes Thompson as one of the most valuable health resorts of South Africa for **phthisical patients**. In the neighborhood are some thermal sulphur springs that have a temperature of 95° F.

KIMBERLEY, situated at latitude 28° 48' south, the great center of South African diamond mining, lies at an elevation of 4042 feet above sea-level, 485 miles distant by railway from Port Elizabeth. The mean summer temperature is 74.6° F. The mean winter temperature is 57.9° F. The mean annual relative humidity is 55 per cent. The annual rainfall averages about 18 inches, and occurs chiefly during the summer months. Although the town lies in the country north of the Orange River, it may be regarded as a continuation northward of the Upper Karoo. The sanatorium founded by Mr. Rhodes is half a mile from the town of Kimberley, on the tram-line between Kimberley and Beaconsfield; it stands in grounds of its own and has a fine outlook. The arrangements are similar to those of a good hotel, and are, of course, not suitable for advanced cases of tuberculosis.

BARKLY WEST has a sanatorium, the **Barkly West Home**, that, according to Dr. G. A. Heberden,¹ is prettily situated on the northern bank of the Vaal River, at an altitude of about 4000 feet, within an easy drive of Kimberley.

BLOEMFONTEIN, situated at latitude 29° 12' south, stands on level ground at an elevation of 4518 feet above sea-level, and is fairly sheltered by neighboring hills. The mean maximum temperature for the year is 76.5° F. The mean minimum temperature is 45.5° F. The mean annual relative humidity is about 58 per cent. The annual rainfall is about 21 inches, with 66 rainy days, chiefly during summer. The climate has an established reputation in **pulmonary affections**.

HARRISMITH, 28° 20' south, in the Orange River Colony, about twenty-three miles by rail from the Natal border, has quite a reputation in the treatment of **pulmonary tuberculosis**. According to Dr. E. F. B. Wilson,² the town lies at an elevation of 5250 feet

¹ See "The South African Climate," by Dr. W. C. Scholtz, London, 1897.

² In Dr. Scholtz's "The South African Climate," already quoted.

above sea-level, with the Drakensberg on the south and east, and the Plaatberg on the northeast. It is built on a sandy ridge that slopes on one side toward the Plaatberg, and on the other toward the Wilge River. Dr. Wilson thus describes the climate: "In the summer the days are warm, the mornings, evenings, and nights pleasantly cool; even in the hottest season it is never necessary to dispense with a blanket. The thunder-storms clear the atmosphere, and, notwithstanding the rain, mists are rare, though frequently seen on the mountains in the distance. When the thermometer shows a temperature of something between 80° and 90° F. in the shade, the heat never feels oppressive. This is due to the rarefied atmosphere and to the fact that there is always a slight breeze. The winter is characterized by absence of rain, by warm, clear days, frosty nights, and, particularly at the end of the season, by high westerly winds and occasional dust-storms, which, fortunately, however, are not of long duration. Considerable variations of temperature are apt to occur, especially on summer afternoons; but though a feature of the climate which has to be taken into consideration, these variations are not common." The accommodation for invalids is, on the whole, tolerable, but Dr. Smith says that advanced and complicated cases of pulmonary tuberculosis should on no account be sent to Harrismith, as it is impossible for them to obtain the attention they require. In early cases, however, with no special counterindications for high altitudes, Harrismith will, we believe, when proper sanatorium arrangements have been made, become one of the best localities for the treatment of this disease.

PRETORIA, in latitude 25° 46' south, and 4500 feet above sea-level, is situated in a hollow, and the surrounding hills are covered with mist in summer. The summers are hot, but the winter climate is clear, sunny, and bracing. The annual rainfall is 31 inches. The surrounding country is not very attractive.

WARMBAD (**Waterberg Hot Springs**), in the Transvaal, a station on the Pretoria-Pietersburg Railway, about fifty miles north of Pretoria, has an abundant supply of simple thermal water, with a bath establishment and hotel accommodation. The temperature of the springs is from 120° to 140° F. The locality is said to be not quite free from malaria during the rainy season.

HEIDELBERG, at an altitude of 5000 feet, in the Transvaal, on the mountain slopes to the southeast of Johannesburg, is said to be much resorted to by invalids from Pretoria and Johannesburg.

PIETERMARITZBURG, or MARITZBURG, in latitude $29^{\circ} 34'$ south, the capital of Natal, is situated at an altitude of 2200 feet, forty-one miles distant from the coast. The mean annual temperature is 65° F. The moist southeast winds are prevalent, and the mean annual rainfall averages as much as 38 inches, with 123 rainy days, chiefly in the summer months. It is a picturesque town, situated somewhat in a hollow, and, according to Dr. Symes Thompson, the climate is useful in laryngeal and bronchial irritation.

CHAPTER XII

ASIA

The Hill Climates of the Indian Empire. The Himalayan Stations. The Bombay Presidency. The Nilgiri Hills. Other Indian Resorts.

THE HILL CLIMATES OF THE INDIAN EMPIRE

Although many of the hill stations of India have a fairly high elevation above sea-level, their climates differ considerably from those of high altitude stations in Europe, owing to their nearness to the equator and to the existence of a 'rainy season,' caused by the periodic prevalence of the warm, moisture-laden southwest monsoon.

"There are three distinct seasons in India," says Sir Joseph Fayrer,¹ "the hot, the rainy, and the cold, which vary in time of setting in and in duration according to latitude, elevation, and other physical conditions. Approximately the cold season extends from November to March, the hot from March to June or July, and the rainy from that to October, these seasons being greatly influenced by the monsoons." Dr. W. J. J. Simpson² says: "Amongst resident Anglo-Indians there is a regular movement of the women and children to the hills on the approach of the hot season, and a return to the plains at the commencement of the cold weather. The chief officers of government, imperial and local, have their offices in the hills. Many of the hill stations are 7000 feet high and well above the fever level, and of these SIMLA and MUSSOORIE serve as the sanatoria of the north, DARJEELING for Bengal, and OOTACAMUND, the most delightful of them all, for Madras. Of hill stations not nearly so high in altitude, POONA, MAHABLESHWAR, and LANOWLI are convenient resorts for the residents of Bombay.

¹ "The Hill Stations of India as Health Resorts," "British Medical Journal," June 9, 1900.

² "Health Abroad," edited by Dr. E. Hobhouse, London, 1899, p. 308.

The hill climates are at their best in October, November, and December." It is during this season that the cool, dry, northeast monsoon prevails and exercises its bracing influence.

The hill climates, says Dr. Simpson, "suit the physically sound, the fever-stricken, and the debilitated, but they do not agree with patients suffering from bowel complaints or internal congestions. Even to the healthy the high altitude and cooler climate is at first a strain to the constitution, and is attended with suppressed action of the skin, increased activity of the kidneys, a quickened pulse, and not infrequently with diarrhea. Still the hills, for the European, are healthier and more congenial than the plains, and it is to the sanatoria established there that Europeans resort, whenever they can, for health and for pleasure."

Sir J. Fayrer even raises the question whether the hill stations of India might not be more frequently resorted to by persons from England who contemplate prolonged residence in a milder and more genial climate, the winter being spent in the plains or on the plateau of the Deccan, and the hot weather in one of the hill stations. In many cases the existence of a rainy season and the difficulties in regard to obtaining sufficient walking exercise on level ground are disadvantages that would probably render more difficult the carrying out of the all-the-year-round 'open-air treatment' for **pulmonary tuberculosis** at the hill stations of India, as it is carried out in the European Alps. With some modifications, however, necessitated by the climatic conditions, tuberculous patients, natives as well as Europeans, might obtain much benefit from the hill stations.

THE HIMALAYAN STATIONS

The Himalayan stations are situated among the ridges of the sub-Himalayan region, and have altitudes of from 4000 to 8000 feet, and annual rainfalls ranging from about 70 to 150 inches. The mean monthly temperatures vary from about 40° F. for January, the coldest month (Simla and Darjeeling), to about 80° F. for June (Simla).

SIMLA, in latitude 31° 6' north, longitude 77° 11' east, the seat of the vice-regal court during summer, is situated in the Himalaya Mountains, 170 miles to the north of Delhi. The houses are scat-

PLATE III.

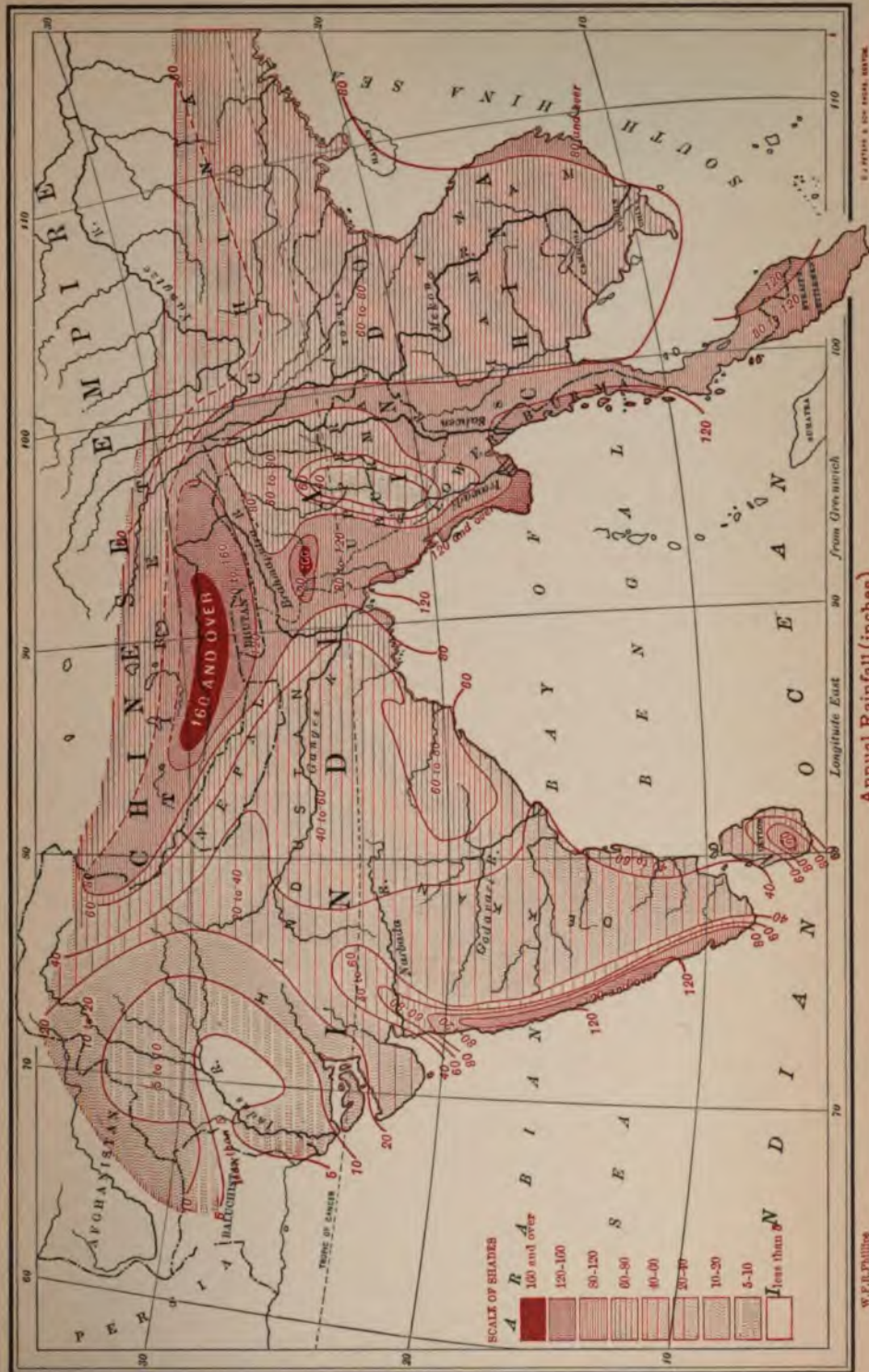




PLATE IV.

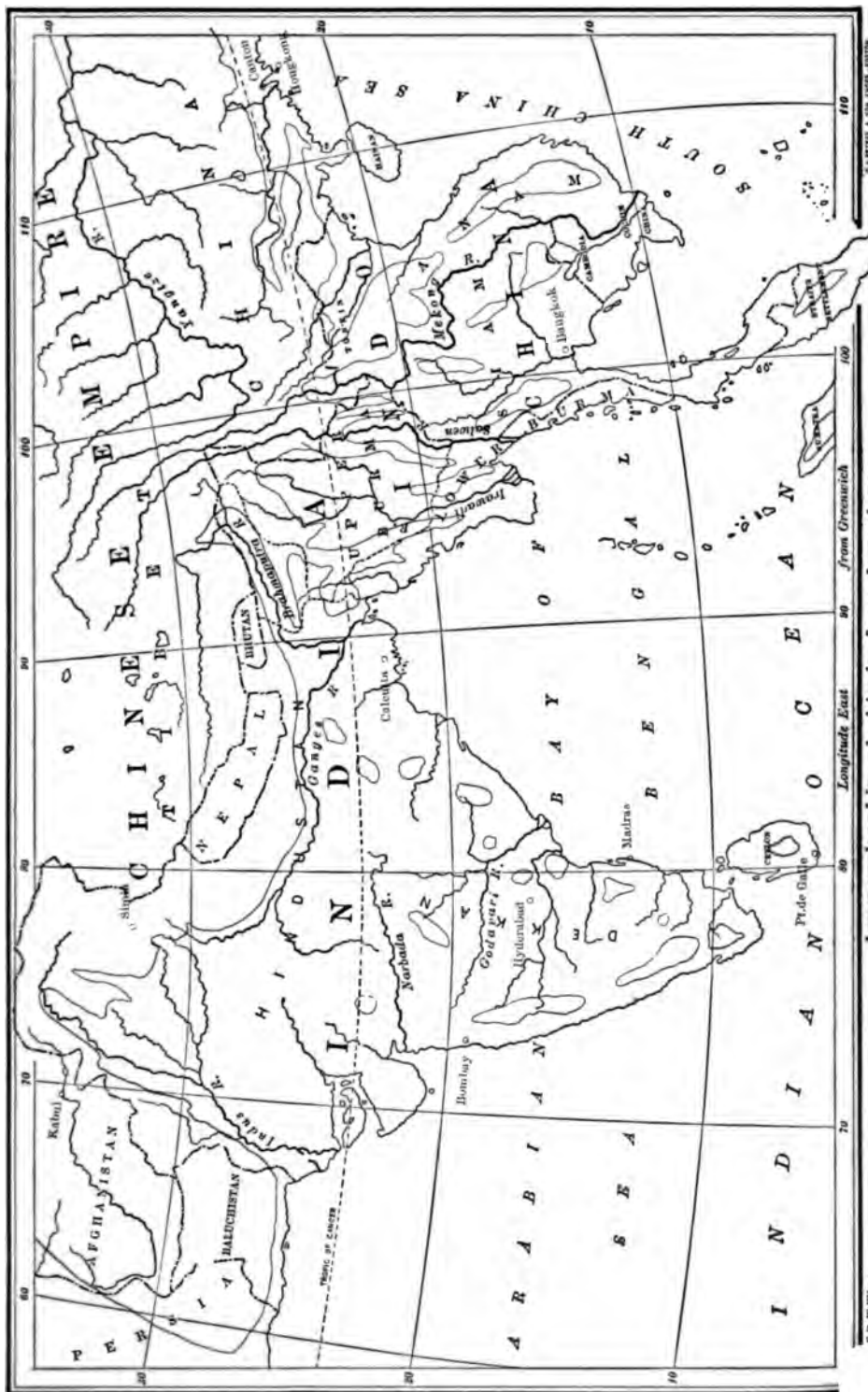
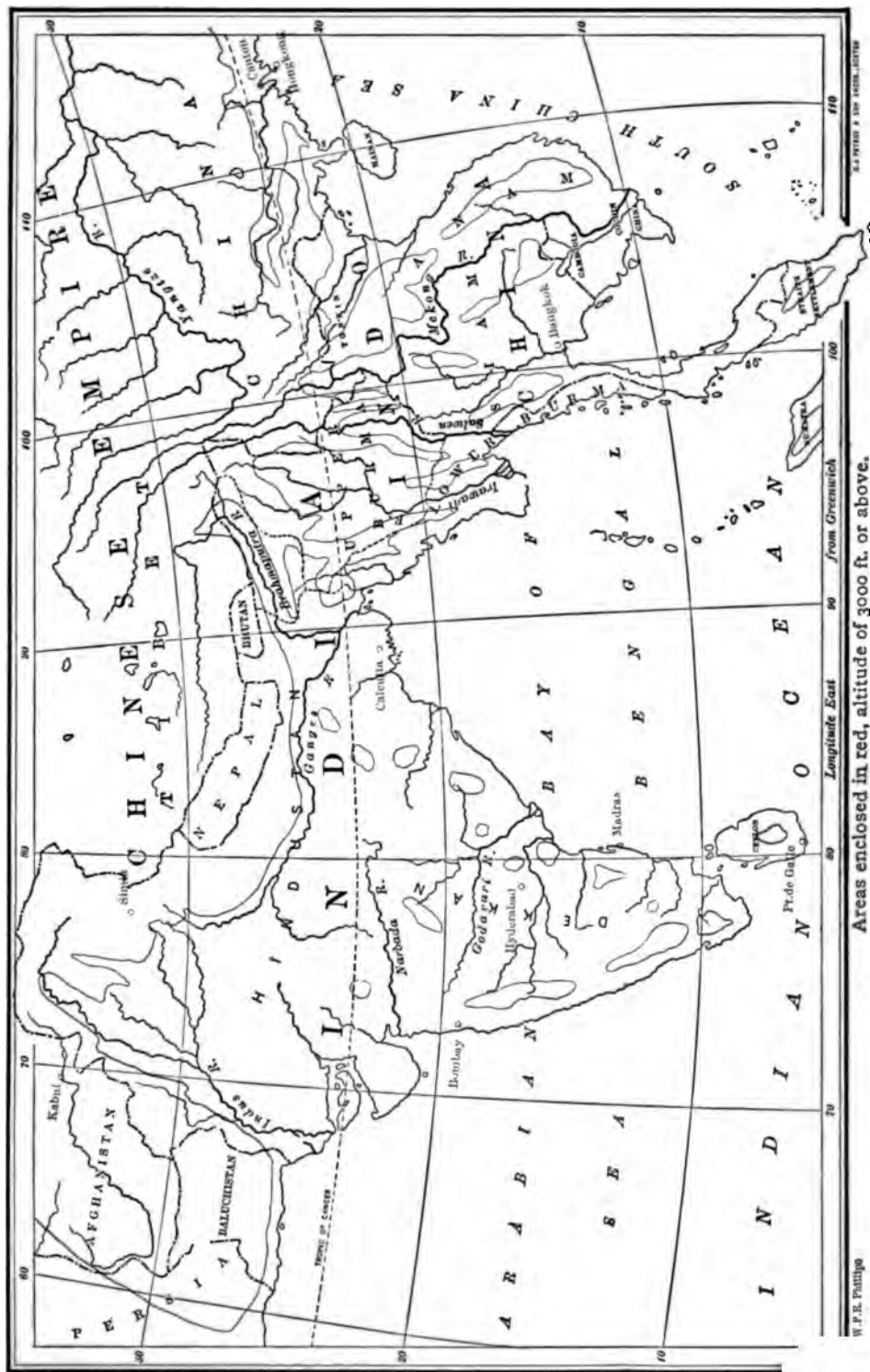


PLATE IV.



Areas enclosed in red, altitude of 3000 ft. or above.

W.F.R. Pithay



tered about on the hill at an elevation of from 6500 to 8000 feet above sea-level. The hills about Simla are usually covered with luxuriant foliage. The mean annual temperature is 60° F. The annual rainfall averages 76 inches. The periodic rains begin in July and continue with intervals until the middle of September; in October the air is peculiarly bright and clear. Simla is too fashionable for some persons, and is regarded as not furnishing enough sport. CHINI, a neighboring ridge, is bracing and healthful. At SANOWER, close to Simla, is located an asylum for European children.

DARJEELING, in Bengal, in latitude 27° 2' north, longitude 88° 18' east, lies at an altitude of from 6500 to 8000 feet, and 308 miles north of Calcutta. It has the reputation of being the coolest station in India. The mean annual temperature is 54° F. The mean winter temperature is 41° F.; the mean summer temperature, 73° F. The annual rainfall is about 132 inches. KURSEONG (4500 feet) is a sort of half-way station to Darjeeling.

In the vicinity of Simla, and between this station on the west and Darjeeling on the east, a number of hill stations are scattered about the southern declivities of the Himalayas, with elevations varying from 4000 feet to 8000 feet above sea-level. Among these are the following :

KUSSOULI, thirty-two miles from Simla, stands in a well-wooded district at an altitude of 6500 feet. SABATHU, at an altitude of 4000 feet, is hotter and drier than Kussouli, from which it is nine miles distant. DAGSHAI, eight miles east of Kussouli, has an altitude of from 5000 to 6000 feet. The hills are destitute of trees. The annual rainfall is about 70 inches. MARRI, at an altitude of 6500 feet, and NAINI TAL, or NYNEE TAL, at an altitude of 6200 feet, are other resorts in the Punjaub between Simla and Umbala. Fayrer says that the picturesque station of Naini Tal is easily accessible by railway to the foot of the hill. The temperature in summer rarely exceeds 80° F., and in winter it may fall to the freezing-point. The average annual rainfall is 70 inches. Somewhat further east is MUSSOORIE (MISSOURI), close to LANDOUR, with houses scattered about at elevations varying from 6000 to 7500 feet above sea-level. Cullimore says: "To the north, tower the snowy moun-

tains; to the south, you look down on the beautiful valley of the Deccan. January and February are very cold, with frost and snow, and they are succeeded by showers of rain in March and April, from which period till the monsoon, in the middle of June, the climate is settled. The rains, which are heavy, cease in mid-September, and are followed by delightful weather, till early January." He adds that the temperature is 20° F. cooler than at the neighboring stations, and that Mussoorie, although suitable for the fairly strong, is, owing to the want of shade, less pleasant than Simla.

THE BOMBAY PRESIDENCY

Further south, within or quite close to the tropics, in the Bombay Presidency, are some hill stations at much lower elevations—from 1800 to 5000 feet—that are convenient resorts for residents of Bombay. MAHABLESHWAR, the summer capital for Bombay, in latitude 17° 57' north, is the principal of these, and has an elevation of 4750 feet. The mean monthly temperatures vary only about 11° F.—from 63° F. in December to 74.1° F. in April. The daily range is about 8° F. The annual rainfall is very great, the average, it is said, being 229 inches. This station is the great hill resort for residents of Bombay, from which it is 290 miles distant *via* Poona. Wright considers it too rainy and damp. Payson describes it as occupying the northwesterly region of the extensive table land of Mahableshwar in the Western Ghats. It has a southwest aspect, is densely wooded, and has magnificent scenery and opportunities for excellent rides and drives. The drinking water is good. The season lasts from March to June. In March and April the thermometer may rise to nearly 90° F., but the nights are almost always cool and refreshing. Early in June the monsoon blows, but ceases in September.

POONA, in latitude 18° 31' north, has an altitude of 1800 feet, a mean temperature of 79° F., and a difference of about 13° F. between the monthly means. Although not a health resort proper, it may be mentioned here on account of its good climatic reputation. The recent plague epidemic makes one suspect the sanitation.

MATHERAN, in latitude 18° 58' north, about twenty miles in a straight line from Bombay, has an elevation of only 2460 feet above

sea-level, but its abrupt rise from the plain and its sea-breezes make its climate refreshing.

MOUNT ABU, latitude $24^{\circ} 35'$ north, in the State of Rajupatana, really belongs to the Aravallis, but is separated by the valley of the Western Banass River. It has an average height of 4000 feet above sea-level. The mean annual temperature is 70° F. The mean annual rainfall is 64 inches. This station is not quite within the tropics.

PACHMARI, latitude $22^{\circ} 30'$ north, in the Central Provinces, is, according to Wright, "a hill station only by courtesy," as a punka is required in the daytime. The mean temperature for the year is 69° F.; for January, 58° F.; for July, 71° F. The mean annual rainfall is 78 inches. It is at an altitude of 3530 feet.

THE NILGIRI HILLS

In the Nilgiri Hills, in **Madras Presidency**, between latitudes 11° and 12° north, are some hill stations that are serviceable for residents in Madras. The southwest monsoon loses much of its moisture in passing over the coast hills before it reaches the health resorts. The Nilgiri hill stations have, therefore, an annual rainfall of only about from 50 to 60 inches, and have a drier, yet possibly a more equable, climate than the Himalayan stations. The general elevations of the table-lands range from 5000 to 7600 feet. The mean winter temperature is 60° F. The mean summer temperature is 65° F. Cullimore says: "January, February, and March are clear and dry, with frosty mornings and a powerful midday sun. The little rains occur late in March, and April and May are pleasant, with frequent showers and thunder. The southwest monsoon breaks in June, attended at first with heavy rain; but between this and the end of September there are long intervals of delightful dryish weather. October is stormy and windy or fine, according to the advent of the northeast monsoon. November is showery and unpleasant, with fogs. In December the weather is cool and bracing, with morning frost. The seasons are subject to many changes."

OOTACAMUND (UTACAMAND), the chief station in the Nilgiris, occupies a fairly open position at an elevation of from 7000 to 7500 feet

above sea-level; it is the summer seat of the government of the Madras Presidency. Dr. W. J. J. Simpson speaks of it as the most delightful of the hill stations of India. It is said to be equally pleasant as a residence in winter and in summer. The mean annual rainfall averages 60 inches, derived partly from the northeast as well as from the southwest monsoon. The mean monthly temperatures range from 53° F. in December to 63° F. in July, August, and September. Dr. R. T. Wright¹ well points out some of the characteristic advantages of Ootacamund: "The roads are good, both in the station and in the district, and so broad that people drive in the same carriages that they use in the plains, instead of having to go about in rickshaws or dandies, as one must do in other hill stations on their narrow pathways, by courtesy called *roads*." It possesses the grassy Hobart Park, large enough for cricket, foot-ball, polo, and tennis, and having a surrounding course for riding; a little lake, large enough for rowing; golf-links, and the 'Downs,' where jackal hunting can be indulged in. According to Cullimore, KOTAGHERRI, or KOTAGIRI (6570 feet), affords a pleasant change during the southwest monsoon, which is not felt so much as at Ootacamund, eighteen miles distant; this station and the military station of WELLINGTON (6100 feet), ten miles from Ootacamund, are, he thinks, better suited for those enfeebled by long residence on the plains or who have suffered from visceral disease. CONOOR, or COONOOR, likewise in the Nilgiris, twelve miles from Ootacamund, has an altitude of 5880 feet. The mean annual temperature is 64° F. The scenery of Conoor is more beautiful than that of Ootacamund.

OTHER INDIAN RESORTS

Further south than the Nilgiris are the PULLNEY HILLS, between latitudes 10° and 11° north, and about half-way between the east and west coasts. They have an altitude of about 7000 feet and a relatively small rainfall.

There are several other popular hill stations in various parts of India that are not of sufficient importance to require mention here.

¹ "British Medical Journal," November 17, 1900.

To the north of India, on the **northern declivities of the Himalayas**, in **Cashmere**, and on the elevated **plateaus of Tibet** are sites, at elevations of from 5000 to 11,000 feet above sea-level, that may at future periods be used as health resorts. The moist monsoon from the Indian Ocean has been robbed of its moisture in passing over India and the Himalayan heights before it reaches these parts, which, consequently, have dry and bracing climates.

Much further north, in the Russian and Chinese empires, are the **vast Steppes of Tartary**, large tracts of which have very scanty vegetation and a pure, dry, desert air. Some parts of the steppes are below sea-level, while others are considerably elevated. The inhabitants of the steppes are remarkably free from **pulmonary tuberculosis**, an immunity which they doubtless owe, like the Bedouins and wandering tribes of the Arabian and African deserts, to the open-air life they lead and to the sparsity of the population. **Kumiss**, a fermented drink made in the Russian steppes from mare's milk, has been imitated in Europe, and is much employed in **pulmonary affections, anorexia, and cachectic conditions**.

CHAPTER XIII

ISLAND RESORTS OF THE PACIFIC

Australasia—Australia. Tasmania. New Zealand. The Auckland Islands. Polynesia and the Tropical Islands of the Pacific—The Society Islands. The Friendly Islands. The Fiji Islands. The Sandwich Islands. The Philippine Islands.

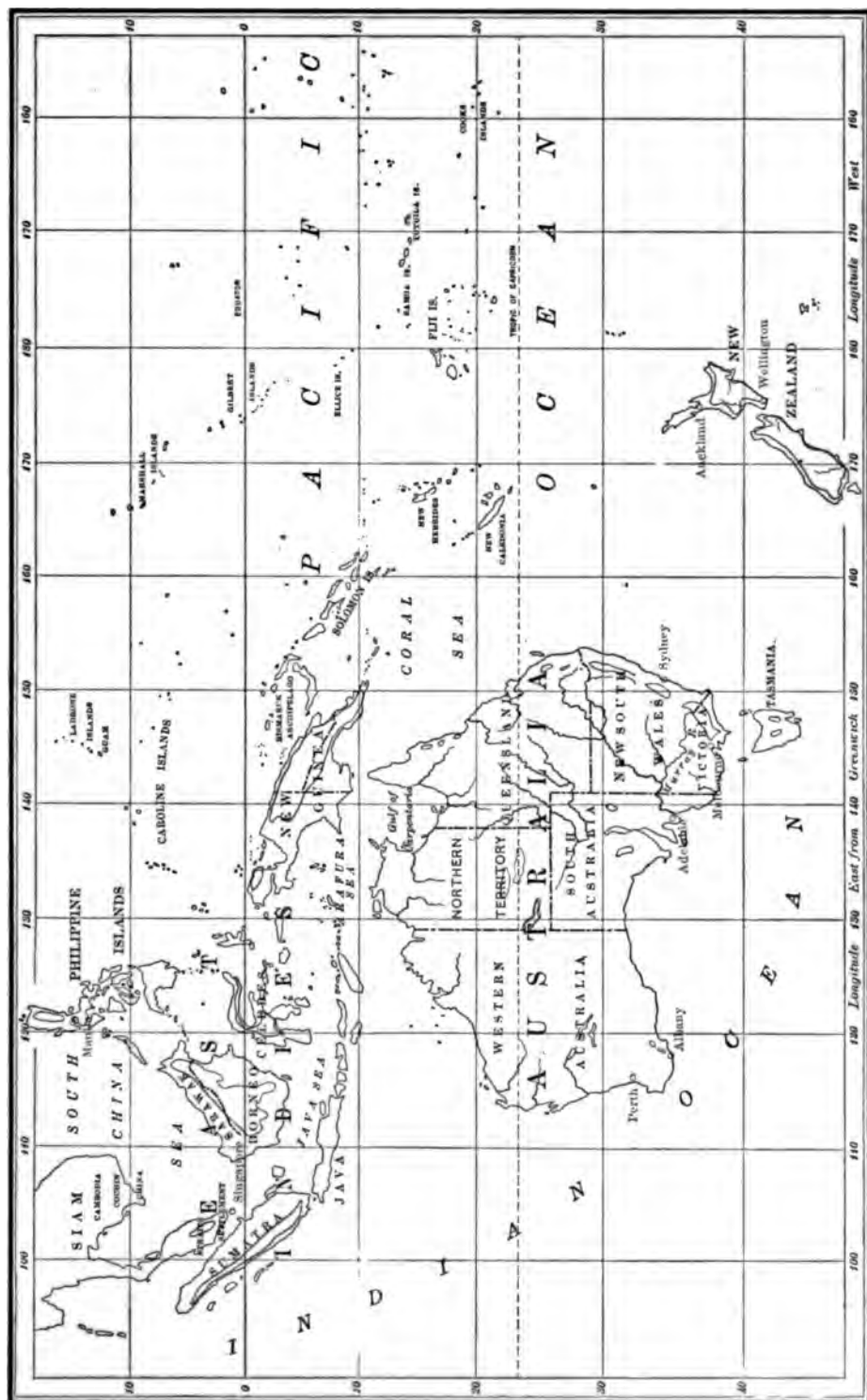
AUSTRALASIA

AUSTRALIA

Mention has already been made of the voyages to and from Australia and New Zealand and of their therapeutic uses (Book I, Part II, pp. 75 and 76), and a brief consideration of the climates of these islands from a medical point of view will now be given:

The cases of **pulmonary tuberculosis** for which a longer or shorter residence in Australia can be recommended are limited. First, the prolonged sea voyage is, in many cases, a counterindication. Secondly, the accommodation and arrangements for securing continuous medical supervision of patients are lacking. Patients with acute or very advanced disease cannot be advised to go to Australia, nor cases with **laryngeal, intestinal, or renal complications**. In fact, it is suitable only for those patients who are in the early stages, who have fairly good powers of resistance, and who are without fever or any grave complications. S. Solis Cohen, however, would add to this list some of those classes of patients for whom he advises sea voyages of moderate or considerable length; especially young persons fairly robust, and able, when well, to cope with circumstances, but who have become infected by chance and exhibit, on land, persistent limited softening or persistently recurring pyrexia. The climates of the coast towns are not suited to consumptives, and patients who desire to earn their own living in towns would find Denver and the high altitude resorts of the Rocky Mountains, in the United States of America, or the towns of the

PLATE V.



Areas enclosed in red, altitude of 3000 ft. or above.

W. F. B. Phillips.

plateau of Mexico, more appropriate; whereas those who wish to live an open-air country life have, at least, the alternative of the South African climates. However, the inland districts of Australia undoubtedly have advantages in some early cases of phthisis, and may be recommended to fairly vigorous young men, who are not too fastidious as to food, and the like, and who, as Dr. C. T. Williams points out, should have 'pastoral' tastes and should be prepared to spend years in the recovery of their health.

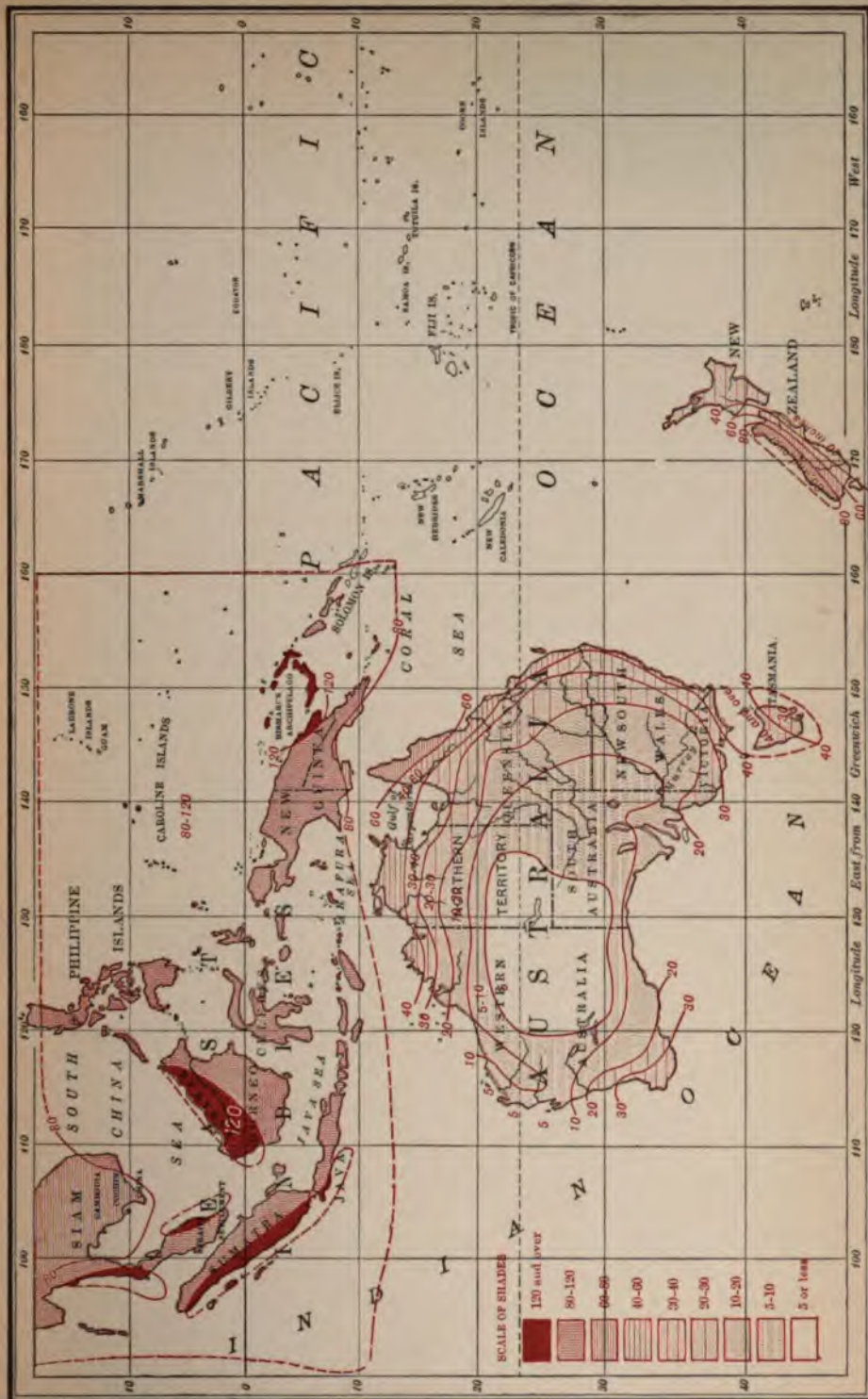
Australia, owing to its great size, possesses many different climates. The mountain ranges are mostly situated near the coast, while the interior contains immense undulating, parched, and almost rainless tracts. The heat in these parts, especially in the northern tropical regions, often becomes intense, at times rising to considerably over 100° F. in the shade. Storms are frequent. On the southeastern littoral, where most of the chief towns are situated, the dry, hot northerly winds from the inland deserts, occurring several times in the summer, are felt as scorching blasts, comparable with the dust-laden 'sirocco' of Africa; they may be followed by gales from the cold antarctic regions ('southerly bursters'), produced by the indraft, to supply the place of the rising columns of hot dry air over the deserts. When the wind veers round from north to south, the fall of temperature is very sudden, and rain and storms may occur. The gale may be so violent as not only to raise vast clouds of dust, but also to carry all obstacles before it.

The littoral region of South Australia included between the mountains and the sea, and varying in breadth from 20 to 150 miles, comprises the most settled districts and the chief cities of the various colonies. Lindsay¹ describes this region as in the main flat and bare, parched in summer, and ranking low in point of natural beauty. "In all directions stretches the level plain or the low sand-hill, and everywhere are the gum and the wattle. The climate of this region shares the general characteristics of Australia. The summer heat is very great, though somewhat less than upon the inland plains. The hot wind is distressing at Melbourne and Adelaide, less frequent at Sydney, and unknown at Brisbane. The rainfall is considerable,

¹ J. A. Lindsay, "The Climatic Treatment of Consumption," London, 1887, p. 106.

varying from 70 inches per annum at Brisbane, to 60 at Port Macquarie, 50 at Sydney, 50 at Cape Otway, 30 at Melbourne, and 20 at Adelaide." "The rain comes in sudden deluges, and days of drizzling wet, so frequent in England, are unknown." According to Lindsay, the coast region is the most variable region of Australia in regard to climate. "Sudden changes of temperature are frequent, and days of stifling heat are not uncommonly succeeded by evenings of storm, rain, and chill." "It must," he says, "be laid down in the most dogmatic manner that the summer climate of the Australian littoral region is variable and capricious, and wholly unsuited to the necessities of the consumptive. At some favored regions, such as EDEN and TWOFOLD BAY, in New South Wales, and parts of Gippsland, in Victoria, this variability is reduced by conditions of local shelter; but the invalid is apt to resort to one of the colonial capitals, which all possess an objectionable climate." Among the more favored portions of the littoral, Lindsay also includes PARRAMATTA, which lies among orange groves, at the head of Port Jackson, and has a drier and cooler climate than Sydney. "The Illawarra district of New South Wales is a district of gardens, orchards, and pastures, and deserves its title of the 'garden of the colony.' GIPPSLAND, in Victoria, is a region of forests and gullies, fern-tree dells and waterfalls, vineyards and hop-gardens—very unlike the typical conception of Australia." There are, of course, many resorts along the coast, such as ST. KILDA, near Melbourne, and MANLY, near Sydney, that are suitable for Australian residents requiring a temporary change with rest and recreation. The regions in Australia that may at present be considered as of value to invalids, not only as to climate but also as to facilities for accommodation, etc., comprise (1) the inland plains and (2) some places in the Blue Mountains (latitude 32° to 35° south) of New South Wales and the Australian Alps (between latitudes 36° and 38° south) of Victoria.

The Australian Mountains.—The ranges that run parallel to the coast of the eastern portion of Australia vary in height from 3000 to 7000 feet, attaining their greatest altitude in MOUNT KOSCIUSKO (7175 feet) in the Australian Alps. For real invalids there are not many places at present available in the mountains; those that exist are refreshing resorts for the summer months, but in



W. J. R. P. 1907

Annual Rainfall (inches)

24 MILES 400 YARDS 1000 FEET

winter, according to J. A. Lindsay¹ the mountains are, for the most part, deluged with rain and swept by winds. There is no resort that approaches one of the high altitude stations in Switzerland, open to invalids all the year round. MOUNT MACEDON, in Victoria, forty-four miles from Melbourne, consists of Upper Macedon, beautifully situated in a well-wooded district 2200 to 3000 feet above sea-level, and Lower Macedon, at an altitude of 1660 feet, with a good sanatorium, called the **Braemar Wood End**, which is situated on a plateau 2500 feet above sea-level and connected by railway with Melbourne. The mean annual temperature of Macedon is 53° F. ; of Upper Macedon, 48.2° F. The annual rainfall is 35.7 inches. MOUNT VICTORIA, in New South Wales, seventy-seven miles from Sydney, is situated amidst fine scenery in the Blue Mountains at an elevation of 3490 feet, and is said to have the same mean annual temperature and nearly the same mean annual rainfall as Macedon. KATOOMBA (3349 feet), sixty-six miles by railway from Sydney, is another mountain station in New South Wales in the midst of the Blue Mountains, and is said to have a somewhat moister climate than Mount Victoria. BOOROO LONG, although hardly an invalid station, seems to be the highest mountain resort, attaining an altitude of 4328 feet, and situated in the center of the New England table-land in New South Wales, eighty-seven miles from the coast.

The inland plains available for invalids comprise the Riverina district and the Darling Downs. In appropriate cases they afford patients the opportunity of leading an open-air life in a warm, sunny, dry climate, somewhat approaching in character that of the desert. The disadvantages are the dust, the occasional hot desert winds, and the danger of drought.

The Riverina plain (latitude 29° to 36° south) is the vast sheep-farming district in New South Wales consisting, Lindsay tells us, of undulating downs and rolling prairies, destitute for the most part of trees or grass, but producing large quantities of the salt-bush (*mesembryanthemum*), which affords excellent fodder for sheep. The district is bounded on the south by the river Murray, whose

¹ *Op. cit.*

tributaries, the Murrumbidgee, the Lachlan, and the Darling, give it its name; to the west is the great central desert; to the north is Queensland; and to the east are the Australian Alps, the Blue Mountains, and the Darling Downs. The average rainfall—not more than 14 inches per annum—is too scanty for agricultural purposes, although the district is said to be unrivaled for pasturage. The thermometer frequently rises to 110° F. or higher during summer, but, owing to the great dryness of the atmosphere, the heat is easily endured. Hot winds from the north and dust-storms are frequent, but days of still, cloudless sunshine are the rule in summer, and although the summer heat may be trying, the other seasons, according to Lindsay, are delightful. In winter the midday, he says, is always warm, although there is a little morning frost.

The Darling Downs, in Queensland, to the northeast of the Riverina plain, are more elevated—2000 feet above sea-level—and are somewhat cooler; they are further removed from the central desert, and less exposed to the hot winds.

Both in the Riverina and in the Darling Downs there are towns that furnish simple accommodation to visitors and to the class of invalids for whom, as has been said, life in Australia is suitable. Among these are Deniliguin, in the Riverina, and Toowoomba and Warwick, in the Darling Downs.

TASMANIA

Tasmania, an island about the size of Ireland, lies in latitude 40° to 43° south, to the south of Victoria. It is shaped somewhat like a heart, the blunted apex of which, with Hobart, the chief town, looks toward the south, while the base, with Launceston, faces Australia and the north. The surface and scenery of the island are much diversified, there being plenty of water and luxuriant vegetation, as well as mountains rising to from 4000 to 5000 feet above sea-level. The climate of Tasmania is cooler, moister, and more equable than that of Australia. Although the hot northerly winds that disturb the opposite coast of Australia in summer may likewise visit Tasmania, residents in Australia may find the island a refreshing summer resort. In a certain sense it may be called the sanatorium of Australasia, being likewise fairly suitable and acces-

sible to residents in India whose health has been impaired by malaria and other diseases.

Climatic differences of course exist in the various parts of the island, the eastern part being said to be drier than the western part. The mean annual temperature at Hobart, in the south of the island, is 54° F., with a mean daily range of 16° F. The mean annual temperature at Launceston, in the north of the island, is 55° F., with a mean daily range of 20° F. The mean annual rainfall varies at different parts of the island from about 21 to about 78 inches.

HOBART, the capital of the island, has a picturesque and sheltered position at the foot of Mount Wellington, on the Derwent River, twelve miles above its junction with the sea. During summer it is much visited by Australians who wish to escape the great heat of their own climate. The surroundings are beautiful, and there are numerous interesting excursions to be made in the neighborhood. Its sanitary arrangements are good. The mean annual temperature is 54° F.; the mean daily range, 16° F. The minimum mean monthly temperature for July is 45° F. The maximum mean monthly temperature is 61° F. In the five summer months,¹ from November to March, the extreme temperatures are 86° and 100° F. The annual rainfall is about 22 inches, and there are about 189 rainy days.

LAUNCESTON, the principal town in the north of the island, is situated amidst hills and picturesque scenery on the river Tamar, about forty miles from its mouth. The climate is somewhat less equable, and there is more rain, than at Hobart. The mean annual temperature is 55° F.; the mean daily range, 20° F. The total rainfall for one year was given in Bruck's "Guide" as nearly 31 inches, with 119 rainy days.

NEW ZEALAND

New Zealand, to the southeast of Australia, between latitudes 34° and 47° south, has a climate that, on the whole, is said to resemble somewhat that of Great Britain. As in England, the

¹ L. Bruck's "Guide to the Health Resorts in Australia, Tasmania, and New Zealand," 1888.

weather is generally moderately moist and temperate, and subject to frequent sudden variations; for most persons it is salutary, and it tends to produce a vigorous race. The **North Island** and the **South Island** that, with the small **Stewart Island**, constitute the New Zealand group are both mountainous, the loftiest heights in the two islands ranging from 6000 to 13,000 feet above sea-level. There are a number of lakes of different sizes, and the scenery of the islands is varied, beautiful, and picturesque.

The mean annual temperature of the South Island is 52° F., almost the same as that of London and of New York. The mean annual temperature of the North Island is 57° F. The prevailing winds for the whole year are westerly, and the western coasts of both islands have a decidedly more equable temperature, with a much heavier rainfall, than the eastern coasts, but the westerly winds are often violent. The **Canterbury Plains**, on the eastern side of the South Island, have a moderately wide range of temperature, and are covered with snow in winter, while the summer is very hot. At **CHRISTCHURCH**, on the coast in this region, the annual range of temperature is said to be greater by 18° F. than at **HOKITIKA**, on the opposite western coast, but the annual rainfall—112 inches—at Hokitika is much greater than at Christchurch, where it is only 26 inches. According to Lindsay, the climate of the Canterbury Plains is, on the whole, bright, bracing, and enjoyable, and admirably adapted to the English settler.

The rainfall occurs chiefly during the winter season in the North Island, but is more evenly distributed over the year in the South Island. "The southwestern coasts of New Zealand and the straits between the islands are exposed to stormy weather; thus, at Wellington, on Cook Straits, and at Invercargill, on Foveaux Straits, the winds are generally very boisterous throughout the year."¹

AUCKLAND is picturesquely situated on the shores of the Waitemata harbor, on the narrow isthmus separating this harbor from the Manukau harbor on the west, at an elevation of 260 feet above sea-level. The climate is moist, humid, and sedative or relaxing

¹ L. Bruck's "Guide to the Health Resorts in Australia, Tasmania, and New Zealand," 1888.

to some persons. The mean annual temperature is 59.5° F. ; for winter, 52.3° F. ; for spring, 57.5° F. ; for summer, 66.9° F. ; for autumn, 61.1° F. The mean daily range is 17.8° F. The mean annual rainfall is 47 inches, and there are about 191 rainy days. The mean annual relative humidity appears to be about 76 per cent.

WELLINGTON, at the south of the North Island, the seat of the government of New Zealand, has a mean annual temperature of 55.5° F., with a mean daily range of 12° F., both lower than at Auckland, and slightly more rain. The annual rainfall is 51.5 inches, and there are about 151 rainy days. Wellington is exposed to the strong west and southeast winds, and is noted for its storms and earthquakes.

NAPIER, the capital of Hawke's Bay, on the east of the North Island, is sheltered from the rough wet winds by the Ruahine range of mountains, and is said to have a comparatively dry and quite equable climate. The mean annual temperature is 58.3° F. ; for winter, 49.1° F. ; for spring, 57.7° F. ; for summer, 66.2° F. ; for autumn, 57° F. The mean daily range is 17.4° F.

NELSON, situated on the north coast of the South Island, on the southeastern shore of Blind Bay, is fairly well sheltered from the high prevailing winds. The surroundings afford mountain scenery. The climate is said to be sunny and quite mild, although the mean daily range of temperature is considerable, and it has short, mild winters and long, cool summers, affording invalids plenty of opportunity and inducement for being out-of-doors. The mean annual temperature is 54.8° F. ; for winter, 46.5° F. ; for spring, 54.5° F. ; for summer, 62.7° F. ; for autumn, 55.7° F. The mean daily range is 20.1° F. The mean annual rainfall is 62 inches.

The Thermal Springs District¹ of New Zealand comprises an area of nearly 1000 square miles, with an altitude varying in different parts between 1000 and 2000 feet above sea-level. It is a volcanic district, in some respects analogous to the Yellowstone National Park in the United States of America, and comprises

¹ See "The Thermal Springs District and the Government Sanatorium at Rotorua," by Dr. A. Ginders, Wellington, 1897.

within its boundaries hundreds of hot springs, together with mud-volcanoes, solfataras, and fumaroles. Dr. A. Ginders says: "The most striking physical features of this region are the extensive pumice-plains, intersected in various directions by high ranges of igneous formation, which are relieved here and there by enormous trachytic cones. Forests of extraordinary luxuriance and beauty clothe the mountains and border the extensive plateaus, while hot lakes, boiling geysers, and thermal springs are dotted far and wide over the country."

The springs have temperatures ranging from 60° to 212° F., and include muriated springs containing sodium chlorid, muriated alkaline springs containing sodium chlorid and bicarbonate, and sulphurous springs containing hydrogen sulphid; other springs contain free sulphuric or hydrochloric acid, and others, like some of the so-called 'simple thermal waters' of Europe, contain an unusual proportion of soluble alkaline silicates.

The New Zealand Government has established a **sanatorium** and bathing establishment at ROTORUA, which may be reached from Auckland in about ten hours by the railway. The Sanatorium Reserve comprises an area of about fifty acres on the southern shore of Lake Rotorua, to the north and east of the town of Rotorua. When taken under careful medical supervision, the baths are doubtless of great value in **gouty**, **rheumatic**, and **neuralgic** conditions, and ought to be used extensively by residents in the Australian colonies who are not too weak to endure the journey and the change. Rotorua is situated about forty miles from the coast, at an elevation of about 990 feet above sea-level. The climate is more invigorating than that of the coast, and the winter is considerably colder. Visitors should always be provided with warm as well as light clothing, at whatever time they may arrive, for the difference between sun and shade temperatures and the daily range of temperature may be great. The mean temperature for spring is 53° F.; for summer, 66° F.; for autumn, 57° F.; for winter, 45° F. The mean relative humidity for spring is 74 per cent.; for summer, 66 per cent.; for autumn, 67 per cent.; for winter, 74 per cent. The steam that rises abundantly from the thermal springs and surfaces of water all over the districts prob-

ably contributes considerably to the moisture of the atmosphere. The annual rainfall is about 50 inches, and there are about 140 rainy days. The mean daily range of temperature for spring is 21° F.; for summer, 28° F.; for autumn, 23° F.; for winter, 20° F.

THE AUCKLAND ISLANDS

The Auckland Islands are situated between latitudes 50° and 51° south, in the Pacific Ocean, to the south of New Zealand, to which they belong. They may be described here as having a thoroughly insular climate, with a mean annual temperature of about 52° F., but they are not made use of for permanent habitation.

POLYNESIA AND THE TROPICAL ISLANDS OF THE PACIFIC

The small groups of islands situated far out in the Pacific, between America on the east and Australia with the East Indies on the west, are said to have fairly temperate climates, considering their proximity to the equator. Those that are east of the Fiji group, as the Society Islands and the Sandwich Islands, are represented as being moderately healthful and not much troubled with endemic diseases, whereas the groups nearer Asia, as the Solomon Islands and the New Hebrides, bear a contrary reputation. Among these islands, those of the more salubrious climates are occasionally made use of for therapeutic purposes.

THE SOCIETY ISLANDS have a warm, moist, equable, typically marine climate. TAHITI, the most important of these islands, lies in latitude $17^{\circ} 39'$ south, and has a mean annual temperature of 76.5° F. The mean monthly temperatures are said to range from 66.5° F. to 85° F. During the hottest months of the year, however, the temperature may exceed 100° F. for prolonged periods, and Europeans must remain inactive, at least during the day. The relative humidity averages about from 70 to 90 per cent. There is a summer rainy season, lasting from October to April, when the rain is said to fall continuously for weeks at a time. Tahiti has beautiful scenery and contains mountains that attain an altitude of 7000 feet above sea-level.

THE FRIENDLY ISLANDS, or TONGA ISLANDS, situated between the Society Islands and the Fiji Islands, in latitude 18° to 23° south, are said to have a climate similar to that of the Society Islands, but slightly cooler.

THE FIJI ISLANDS (Viti, or Feejee, Islands) lie between 15° and 19° latitude south. They have a very equable insular climate, and are represented as being, on the whole, not unhealthful, but somewhat relaxing for ordinary constitutions. Malaria is almost unknown. The mean annual temperature is about the same as that of Tahiti, and the mean relative humidity, about 75 per cent.

THE SANDWICH ISLANDS (HAWAIIAN ISLANDS) are a group of eight mountainous islands of volcanic origin between 19° and 22° latitude north. They are said to be well suited for ordinary constitutions. HONOLULU lies in latitude $21^{\circ} 18'$ north, and is situated on a bay of the southwestern shore of Oahi, an island that has beautiful mountain scenery in its interior. The mean annual temperature is 74° F. The difference between the mean winter temperature and the mean summer temperature is only about 7° F. The mean annual relative humidity is about 72 per cent. The annual rainfall is about 26 inches, and the rainy season occurs during the winter months—from December to March. HAWAII, the largest and most southerly of the Sandwich Islands, has, besides the active volcano of Kilauea, two peaks in its interior rising to between 13,700 and 14,000 feet above sea-level. The region to the west (leeward) of the great peaks is said to have a drier and colder climate than the east coast, on which side the rainfall is very great. In view of the importance which these islands have recently acquired for the people of the United States, it has been deemed advisable to append a special chapter on their climatic and sanitary characteristics, which will be found beginning at page 223 of this volume.

THE PHILIPPINE ISLANDS ¹

MANILA, the principal city of Luzon and of the Philippine Islands,

¹ A distinguished medical officer of the United States army writes to the editor that of the Philippine Islands, from the viewpoint of medical climatology, there can be said, for the present, little of real value; exact information being lacking except for very limited regions. To any who might think of visiting the islands for health or pleasure he would say: "Advice to young people about to be married—Don't."

is in 14° north latitude. It has a mean annual temperature of 80° F., with a range of from 60° to 100° F. The mean temperature for January is 77° ; February, 78° ; March, 81° ; April, 83° ; May, 84° ; June, 82° ; July, August, and September, 81° ; October, 80° ; November, 79° ; December, 77° F. There is no month in which the temperature does not rise as high as 91° F. The mean annual humidity is 78 per cent. There are about 135 days annually with rain, and the average rainfall is 75 inches, though this may vary from 35 inches to 120 inches. During February, March, April, and May there may be little or no rain. Manila has an excellent water-supply, with public hydrants even far out in the suburbs.

In the Philippine archipelago dysentery and other so-called tropic diseases are endemic; smallpox is not under complete control, and the general sanitation for the present is uncertain. Malarial affections are rife in districts where the water-supply is bad. Beriberi, multiple neuritis, and infantile convulsions are the principal causes of death. Convalescence from any disease is very slow in the climate of Manila, and the shortest fever is said to leave the patient very weak for a long time. The Philippines cannot, therefore, be said to be available as health resorts.

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CHAPTER XIV

HEALTH RESORTS OF SOUTH AMERICA

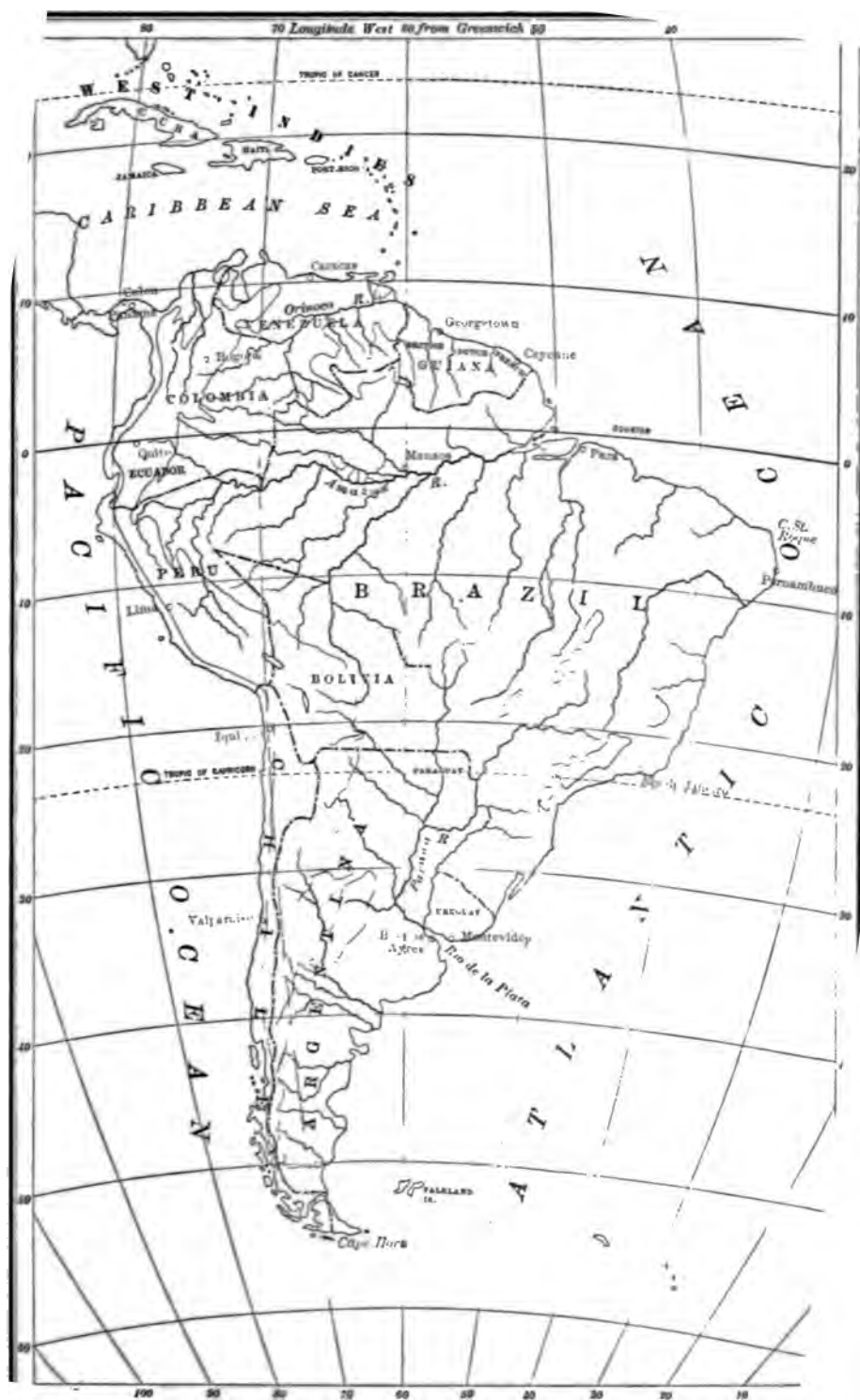
The Andes. Chile. The Argentine Republic. Bolivia. Peru. Brazil. Ecuador. Colombia.

[In the preparation for the press of the chapters on South America, Central America, and the West Indies, the editor has combined articles separately prepared by Dr. Weber and Dr. Hinsdale; these deal, as a rule, with different stations.]

THE ANDES

The Andes extend from the north to the extreme south of the Continent, a distance of about 4180 miles, and have a mean height approximately of about 12,000 feet. The position—parallel with and close to the western coast—and the great height of this immense mountain range explain many of the characters of the climates of South America. In the tropic regions the prevalent winds, which are from the east, are robbed of their moisture during their passage, first, over the eastern part of the Continent (Brazil, etc.), and, secondly, over the Andean mountains. Hence the Peruvian coast-land between the Pacific and the mountain heights is almost rainless, and the curious fact is explained that Lima and its neighborhood, although close to the ocean and having a fairly moist climate, are remarkably free from rain. At Lima itself the mean annual rainfall is 9 inches, but at some parts no rain falls from the clouds, and the country is watered by irrigation or by the misty rain from dense fogs rising from the sea.

The places in South America of most importance from the viewpoint of this work are the **health resorts of high altitude**; the principal ones of these being in Peru, Ecuador, and Colombia (New Granada), on the Pacific slope of the Andes, at elevations between 8000 and 12,000 feet above sea-level; but the increasing commercial relations between North and South America are causing physicians of the United States to be consulted as to



in red, altitude of 3000 ft. or above.

the advisability of journeys to various places in the Latin countries of the Western Continent, and hence some brief references to important business centers have been added.

It was owing chiefly to the observations and writings of Archibald Smith¹ and of Alphonse Guilbert² in Peru and Bolivia that the attention of European medical men was directed to the therapeutic effects of residence in high altitudes. The satisfactory results obtained by sending phthisical patients from Lima and the coast regions of Peru into the high valleys of the Andes led to the utilization of the mountain climates of Europe and North America in pulmonary tuberculosis and other affections, and brought about the establishment of the immense number of mountain health resorts that exist to-day.

Owing to their geographic position near the equator, the Andean resorts, or, rather, the resorts in the tropic portions of the Andes, differ somewhat in their climates from the high altitude resorts in the Swiss Alps and the Rocky Mountains of North America. The equability of the climate in the Peruvian Andes is most remarkable, for, day and night, summer and winter, the temperature is said not to vary more than about 10° F.—absolute annual range. At Huancayo, according to Archibald Smith,³ the temperature in the shade ranges from 50° F. to 63.5° F., and at the cooler town of Jauja the temperature was observed to remain between 50° F. and 60° F. during one whole year. Thus the advantages are that in spite of rarefaction and considerable dryness of the atmosphere, the climate remains warm and the temperature is extraordinarily equable. In the case of consumptive patients, the disadvantages are the long journey and the difficulties met in the effort to secure suitable accommodation, proper food for European and North American tastes, and adequate medical supervision; so that, as Dr. C. T. Wil-

¹ See, especially, "Practical Observations on the Diseases of Peru," by Dr. Archibald Smith, "The Edinburgh Medical and Surgical Journal," 1840, vol. LIV, pp. 5-13.

² See "De la Phthisie Pulmonaire dans ses Rapports avec l'altitude et avec les Races au Perou et en Bolivie," Paris, A. Delahaye, 1862.

³ See "Climate of the Swiss Alps and of the Peruvian Andes Compared," "Dublin Quarterly Journal of Medical Science," 1866, vol. XLI, p. 351.

liams¹ observes, the Andes can be considered a suitable resort only for energetic young men with limited tuberculous lesions, who are capable of enduring fatigue and able to accommodate themselves to conditions of life unlike those to which they have been accustomed. Mountain resorts in the Andes may be found useful for inhabitants of the neighboring countries in a number of morbid conditions, and with improved means of communication they will doubtless come into more general use. Our route of description will be from the south to the north.²

CHILE

Owing to its extreme length and the proximity of high mountains to the coast, Chile presents great diversity of climate. Its coast-line is longer than from Labrador to the southernmost point of Florida, extending through thirty-seven degrees of latitude. At its southern extremity the winters are severe and the annual temperature is low. Travelers in rounding Cape Horn always experience cold weather, particularly in June and July, and the heaviest clothing is needed for voyages along the southern coast of Chile. The capital, SANTIAGO, which has a population of over 200,000, is 1800 feet above the sea. Its situation is beautiful, and the climate is agreeable. VALPARAISO, its port and the chief maritime city on the west coast, is also well situated, but is not so desirable as a place of residence. Their latitude is 33° south. COQUIMBO is situated at latitude 30° south, and COPIAPO at latitude 27° 30' south.

Santiago is colder in winter and warmer in summer than the seaports of Chile. Its mean temperature is very slightly higher than that of Philadelphia. The climate of Copiapo approaches that of San Diego, California, with, of course, a complete reversal as to months. The mean annual rainfall at Santiago is about 10 inches; at Valparaiso, 14 inches, falling sometimes as low as 8 inches; at Copiapo the mean is less than one inch. The tables following show

¹ "Aërotherapeutics, or the Treatment of Lung Diseases by Climate," London, Macmillan & Co., 1894, p. 140.

² For an excellent account of life in the Andes see "The Bolivian Andes," by Sir Martin Conway, London and New York, 1901.

comparatively the temperature and relative and absolute humidity of the places mentioned :

TEMPERATURE (FAHRENHEIT).				RELATIVE HUMIDITY (PERCENTAGE OF SATURATION).				ABSOLUTE HUMIDITY (GRAINS OF VAPOR IN A CUBIC FOOT OF AIR).			
STATIONS.	JAN.	JULY.	YEAR.	STATIONS.	JAN.	JULY.	YEAR.	STATIONS.	JAN.	JULY.	YEAR.
Santiago (1873-86),	68.5	46.2	56.9	Santiago,	67	86	77	Santiago,	5.13	3.25	4.11
Valparaiso (1873-86),	63.1	50.5	56.9	Valparaiso,	75	84	79	Valparaiso,	4.85	3.65	4.22
Coquimbo (1873-86),	68.6	52.7	60.1	Coquimbo,	80	84	84	Coquimbo,	6.14	3.92	4.97
Copaiapo (1873-86),	72.0	54.1	62.1	Copaiapo,	66	63	64	Copaiapo,	5.61	3.07	4.10
				Average,	72	79	76				

The death-rate in Chile is high,—about 54 to 1000,—and is augmented by vice and the excessive use of alcohol.

About 25 per cent. of the deaths in Santiago and 46 per cent. of those in Valparaiso are due to phthisis, and in the winter diphtheria and smallpox prevail. Throat and lung diseases are greatly feared, and on cold days or nights it is the common custom to cover the mouth and nose with some soft fabric, to temper the frosty air. The infant mortality is high. The sanitary conditions generally are not good.

Artificial heat is never used to warm dwellings in Chile, even in the coldest weather. The inhabitants believe the use of fires to be dangerous to health, and wrap themselves in heavy clothing and even furs, as the season demands.

Both in Chile and Peru it is considered hazardous to sit in drafts of air for any length of time, and guests are cautioned in this respect. A disease called *irae*, a form of paralysis affecting the nose and muscles of the face, is produced in this way.

ARGENTINE REPUBLIC

The Argentine Republic contains some stations in the plateaus and mountains that could be made use of by consumptives. It has a population of nearly 5,000,000. It is probably the most prosperous of the South American States, and offers peculiar advantages to immigrants. Colonies founded by Europeans in Buenos Ayres, Santa Fe, and Entre Rios have been remarkably successful.

The great extent of country presents much diversity of climate. On the Atlantic coast are the city and the province of Buenos Ayres, Rio de la Plata, and Parana, the provinces of Santa Fe, Entre Rios, Corrientes, Chaco, and Formosa. The interior districts, including Cordoba, Santiago del Estero, Tucuman, Salta, Rioja, and Catamarca, in their atmospheric dryness and extremes of temperature contrast greatly with the moisture and comparative equability of the coast climate. The region adjacent to the Andes, San Luis, Mendoza, San Juan, and the interior valleys of Catamarca, Rioja, Salta, and Jujuy have marked variations of an agreeable character. The neighboring mountains are covered with snow-caps during the greater part of the year. There are rushing streams, a clear sky, and an exhilarating atmosphere. The temperature ranges from 20° F. in the mountains, to 111° F. at San Juan, the annual mean being 61° F. The seasons are sharply defined—the winters are cold and the summers are hot. The dryness is extreme; a relative humidity of 5 per cent. has been recorded at 12,000 feet. **Dyspnea, vertigo, and anoxemia, general malaise, and oppression** of all vital functions occurring at these elevations have received various names—*e. g.*, 'soroche,' 'bootie paramo,' and 'puna.' Nerves and respiratory stimulants are employed in counteracting these conditions. At PUENTE DEL INCA (9000 feet), temperatures as low as 20° F. are found, with snow in midsummer. Nevertheless the climate is an excellent one, especially at more moderate elevations.

BUENOS AYRES, about 60 feet above sea-level, is the capital of Argentina, and has a population of 800,000. It compares well with European capitals in every particular. Its sanitary system is of an advanced type, and it has hospitals, scientific institutions, and all the adjuncts of a metropolis. There are forty-five parks and squares. The temperature ranges from 30° F. to 103° F. The mean relative humidity is 74.4 per cent., and the rainfall, 36 inches.

BOLIVIA

This country is favorably situated, having a dry climate and good sanitary conditions. Its highest peaks are Illimina, Sorata, Ancohuma, and Penas Hill. Phthisis is said to be unknown among the

natives, but malaria is found near the rivers, goiter is common, and typhoid fever also prevails. Acclimatization is said not to be difficult.

SUCRE, the capital, has an elevation of about 8000 feet. The mean temperature is 55° F., and the mean rainfall, 28 inches, occurring chiefly during December, January, and February; between April and August rain is absent. The city enjoys a good water-supply. The most common diseases are pneumonia, rheumatism, neuralgia, and heart disease. At the Santa Barbara hospital, about 29 per cent. of deaths are from dysentery and 10 per cent. from typhoid fever. LA PAZ DE AYACUCHO, the capital of the Department of La Paz, lies in latitude $16^{\circ} 30'$ south, in the valley of the Chuquipo River, about 13,500 feet above sea-level. The mean annual temperature is about 50° F. Williams says that its climate is more bracing than are those of the Peruvian mountain resorts.

PERU

Archibald Smith spoke of JAUJA and HUANCAYO, in the picturesque valley of the Jauja River (11° to 12° latitude south), as the principal health resorts for **phthisical invalids** from Lima. These towns lie on the left bank of the river, amidst numerous villages and hamlets and beautiful trees; the sky is clear and sunny and the air pure and bracing, making outdoor exercise and recreation attractive. Jauja, situated at an altitude of 10,000 feet, has a climate that, according to A. Smith, is somewhat cooler than that of Huancayo, which stands at a slightly lower elevation.

TARMA, situated at an altitude of about 10,000 feet, is another health resort in the same valley. Some of the earliest successful results recorded by A. Smith were obtained at Tarma. In 1860 the Peruvian Government established a military hospital for **consumptive patients** from the coast in the valley of Jauja.

LIMA, the capital, has about 140,000 inhabitants. It is situated six miles from the sea, and has an elevation of about 500 feet. The maximum temperature is 86° F.; the minimum, 55° F., and the mean, 72° F. The prevailing wind is from the south, blowing gently between 11 A. M. and 2 P. M. The rainfall is scanty, but on the mountain side it is abundant, providing an excellent water-

supply. No thunder-storms occur at Lima. It contains six hospitals—two in the city and four outside. The **diseases most prevalent** are intermittent fever, rheumatism, disorders of the stomach, and tuberculosis. The last causes about 25 per cent. of the total mortality.

AREQUIPA, situated in latitude $16^{\circ} 23'$ north, is the third Peruvian city in importance. It lies in the Andes, at an elevation of 7650 feet, and can be reached by railway from the Pacific port of Mollendo in nine hours. The city, which is known as the 'Gem of the Andes,' is well situated on a green and irrigated sandy plain through which flows the river Chile. There are few trees besides eucalyptus. Pickering, quoted by Solly, states that the hottest day in 1891 was June 3d, when the temperature reached 79° F., the coldest day occurring about a week later, when the thermometer fell to about 38° F. The climate, therefore, seems to be much more changeable than in the Jauja valley. YURA (8500 feet), about twenty miles from Arequipa, has sulphurous mineral waters. CUZCO, the ancient capital of the Incas, lying in latitude $13^{\circ} 10'$ south, has an altitude of about 13,440 feet. A. Smith, however, considered an altitude of from 8000 to 10,000 feet in the Peruvian Andes better suited for phthisical patients than higher elevations.

Foreigners are readily acclimated in Peru, provided they exert proper care in respect to hygiene; if not, they fall victims to abscess of the liver and pulmonary and laryngeal tuberculosis. During the construction of the Oroya Railway in the Andes the laborers suffered with an anemic fever called **Oroya fever**, rebellious to treatment and exceedingly fatal. This disease is also known as **verruqa**, and belongs to the class of zymotic affections; it is inoculable, transmissible from man to man, and probably due to a micro-organism, producing a febrile condition succeeded in grave cases by eruptions of the skin and grave disorganization of the blood. Sixteen years ago Dr. D. A. Carrion lost his life through an experimental inoculation.

A form of lupus, called **la uta**, is prevalent in parts of Peru. In **Vilcamayo valley**, at an elevation of 8000 feet, there is entire absence of wind. The soil is alluvial, clay and limestone alternating, with abundant vegetation and considerable atmospheric moisture.

There is no malarial fever and no endemic other than goiter and cretinism. The prevalence of these affections is attributed to an exclusively vegetable diet.

BRAZIL

Brazil has an area almost equal in size to that of the United States, and has a seaboard of 4000 miles. Its great river, the Amazon, is the largest on the globe, has a length, including windings, of nearly 4000 miles, and drains 2,500,000 square miles of territory. There is a higher region of plateaus, ridges, and broad, open valleys, and, on the other hand, the vast lowland plain of the Amazon, extending to the Andes in Peru, Ecuador, and Colombia, and on the north to the boundary of Venezuela and Guiana. The lowland is hot, and has a wet and a dry season. The table-land in central and southern Brazil has a greater variation of climate, and the four seasons are almost as well marked as in the United States. The wet season of the lowland lasts from December or January until May or June; the remainder of the year is usually dry. The rainfall is very heavy during the wet season, and at S. Luis de Maranhão, southeast of Para, is said to average 280 inches. The Amazon rises forty feet at this season.

RIO DE JANEIRO, in latitude $22^{\circ} 55'$ south, or St. Sebastian, as it was formerly called, is the capital of the republic of Brazil, and is the oldest and the largest city in America south of the equator. In 1900 it was estimated to have 780,000 inhabitants, but this is probably overestimated by at least one-third. It is situated on the western shores of a bay, about twenty miles in breadth. The background is formed by precipitous mountains from 1500 to 3000 feet in height, and covered with a luxuriant vegetation. The site of the city is a marshy plain, studded by hills of granite or gneiss. It was formerly subject to frequent floodings. Intermittent fever prevails at all seasons along the shores and upon the islands of the bay.

Rio de Janeiro is under all the climatic influences common to equatorial regions. The atmosphere is humid. Clouds hang about the hills and frequently cause a suffocating heat called by Brazilians 'mormaco,' a sultry period that is so debilitating as to discourage intellectual or muscular exercise, impairing appetite and digestion,

and leading to a belief that the temperature is much higher than is indicated by the thermometer. The mean annual temperature of Rio is from 73° to 75° F. The winters are not sufficiently severe to arrest yellow fever, and this disease prevails in every month. In 1880, 1546 persons died of it, and in 1881, 206 persons. The epidemic of 1889 was very extensive: the deaths were estimated at 8 per cent. In the epidemic of 1891 the mortality was between 15 and 20 per cent. The drainage and general sanitation of the city have been much improved in recent years. The hospital at St. Sebastian, founded November 9, 1889, was designed for the treatment of epidemic diseases, especially yellow fever. It is situated about four miles from Rio de Janeiro, in an extensive park planted with lemon, orange, eucalyptus, and other trees that have a hygienic and sanitary value. It occupies 35,232 square meters, and consists of seventeen separate buildings.

PARA is eighty miles from the ocean, and has a population of 80,000. It has an exceedingly moist climate of great warmth.

SAO PAULO (2450 feet) is about 250 miles west of Rio de Janeiro, and 40 miles from the port of Santos. It is situated on an open table-land called the 'Highlands.' The soil is porous and dries quickly. There are about 235 days of brilliant sunshine, well distributed throughout the year. Although in December, January, and February the heat may be extreme at midday,—usually over 80° F.,—it rarely reaches 90° F. in the shade. The average minimum night temperatures are 64° F. in January and 49° F. in July. The rainfall is rather heavy, but occurs chiefly in brisk afternoon showers. Fogs never occur later than from 6 to 8 A. M., and only in the cooler season. The prevailing winds are from the northwest, across the Continent, and alternate with southeast winds from the sea, which are cool and damp. Fires are not required, as a rule, on more than twenty evenings in a year. Occasionally there is a rapid and trying change from the land-breeze to the sea-breeze, with accompanying fall of temperature and increase in humidity. Indoors, however, these changes are almost imperceptible. The climate, even in the hotter season, is bracing. The great frequency of thunder-storms may be related to the tonic condition of the air. The small amount of sensible perspiration renders exercise always

enjoyable. Coughs and colds are rare complaints, and if contracted, do not last long. Invalids, especially those with **throat and lung affections** and **convalescents** generally, are benefited by the out-of-door life and the breathing of rarefied air warmed by brilliant sunshine. Sao Paulo has about 70,000 inhabitants. On one of the hillsides outside the city is a well-conducted **sanatorium** under English auspices. CAMPINAS (2250 feet) is situated on the first plateau of Brazil, eighty-four miles from the coast, 275 miles west of Rio de Janeiro, and fifty miles from Sao Paulo. It is subject to epidemics of yellow fever.

Tuberculosis causes from 15 to 20 per cent. of all deaths throughout Brazil. During 1900 and 1901 the plague has been a serious factor at all Brazilian ports.

ECUADOR

QUITO, the capital of Ecuador, lies close to the equator, at an elevation of 9350 feet above sea-level, and possesses a climate that by some has been said to resemble a perpetual autumn or a perpetual spring. The mean annual temperature is about 56° F. The temperature is said rarely to rise above 90° F. or to fall below 40° F., and the daily range is about 10° F. From June to December there is a dry season, and in January the rain-storms are frequent and violent. The mean annual rainfall is 70 inches. Neither the sanitary arrangements nor the accommodations are good.

THE UNITED STATES OF COLOMBIA

The United States of Colombia has a topography of great variety and a corresponding diversity of climate. There are vast plains, extensive table-lands from 5000 to 10,000 feet in altitude, and beyond these the range of the Andes Mountains. The low coastal zone presents all the dangers known in the tropics.

At CARTAGENA, on the north, and on the western coast yellow fever is endemic. At MOMPOX, above the head of the delta of the Magdalena River, the sea-breeze is lost, and from that point to HONDA, the head of navigation, 350 miles from the coast, the voyage is as oppressive as can well be conceived. When Bogota is

reached, a comfortable climate and agreeable accommodation can be found.

BOGOTA, or SANTA FÉ DE BOGOTA, the capital of the United States of Colombia, lies in latitude $4^{\circ} 35'$ north, on a plateau 8665 feet above sea-level. There are said to be three months of fair weather alternating with three months of tropical rains, the rainiest season being in winter. The mean annual rainfall is about 44 inches. In regard to temperature its climate has been likened to that of Malaga, in Spain. The elevation renders it rather cold; the mean annual temperature being given as 59° F., and the mean of each season varying but slightly from this figure. The Bogotanos occasionally change to FUSAGASUGA, elevation 5637 feet, where the temperature is about 78° F., or to TOCAIMA, elevation 1805 feet, and temperature 81° F. These temperatures are nearly constant.

Life is so monotonous in Bogota, owing to the unvarying character of air, food, and clothing, that a change once a year is almost indispensable; all who do not spend some weeks every year in the hot country are soon debilitated. Longevity in this city is said to be rare, few reaching the age of seventy years.

The effect of the climate of Bogota in the case of foreigners is not good at first. The digestive organs are likely to be disturbed. This is said to be quickly corrected by the use of stimulants mixed with the water. "The precautions necessary to preserve health are to be temperate, avoid damp weather, and especially wet shoes, and the use of heavy fruits, like bananas or alligator pears." It is particularly necessary to seek the cleaner parts of the city. Owing to the liability to acute diseases of the respiratory organs, persons going to Bogota should relinquish the light clothing worn in the hot climate and in the voyage up the Magdalena River, and wear flannel next the skin and warm woolen clothing generally. Nervous diseases are common, and physicians say that all diseases are prone to take a nervous form. In the low country, and particularly on the coast, tetanus is frequent, and people carefully avoid all unnecessary transitions from heat to cold. In passing through the lower districts, quinin is generally used as a prophylactic.

In Bogota **phthisis** and **intermittent fevers** contracted in hot climates are relieved; at the stations of medium temperature, **skin**

diseases and certain **nervous affections** are benefited; in the hot climates, **syphilitic diseases**, **asthma**, functional disturbance of the **liver and kidneys**, **chronic catarrh**, and **bronchitis** are said to be ameliorated.

VILLETA is alluvial and sandy. FUSAGASUGA is alluvial, and was formerly the bed of a lake, but is now very dry. The temperature of Villeta ranges from 70° to 80° F.; that of Fusagasuga, from 62° to 75° F. Villeta and Fusagasuga are resorted to for the relief of **pulmonary disease** and **rheumatism**.

SERREZUELA is resorted to for the treatment of **diseases of the digestive organs**. The soil is of clay, and it is very dry. Its high elevation gives it a temperature always of between 45° and 65° F. QUETAME is sandy; its temperature ranges between 62° and 75° F. UBAQUE has the same elevation, temperature, and a similar soil. All these places are mountainous; Serrezuela, however, is situated on a plateau. Villeta and Quetame possess valuable mineral springs for the treatment of **rheumatism** and **skin diseases**.

CHAPTER XV

CENTRAL AMERICA, THE WEST INDIES, AND BERMUDA

The Isthmus of Panama. Costa Rica. Nicaragua. Honduras. San Salvador. Guatemala. The Greater Antilles, or Leeward Islands—Jamaica. Cuba. The Isle of Pines. Puerto Rico. Haiti. The Bahama Islands. The Lesser Antilles, or Windward Islands—Trinidad. Barbados. Other Islands of the Windward Group—St. Lucia. St. Kitts. Antigua. Guadaloupe. Dominica. Martinique. The Bermuda Islands.

CENTRAL AMERICA¹

This narrow strip of land, uniting the continents of North and South America, stretches about 1200 miles from northwest to southeast within the tropics, from latitude 8° to 17° north. Its high mountains, elevated table-lands, and deep valleys present much diversity of climate. The chief elevation of this region is stated as about 7000 feet above sea-level. Hot near the coast, it is cool, bracing, and healthful in the interior. During the entire year the temperature is like that of the northern spring, varying between 55° and 80° F. The heat is never oppressive except in the coast regions, and even there, at no time does it resemble the great heat that afflicts New York or Philadelphia during the months of July and August. The heat is more oppressive on the Atlantic than on the Pacific coast; not, however, on account of any great difference in temperature, but because of the greater prevalence of refreshing breezes and the purity of the air of the Pacific side.

In Central America there are no recognized seasons; the year is divided into two periods—the rainy months and the dry months. During August, September, October, and November it rains regularly every day. During the other months of the year it rains

¹ The editor is indebted to his pupil, Dr. Luis P. Jimenez, of Costa Rica, for a personal communication concerning the climatic conditions of Central America.

occasionally. This region is dotted with volcanoes, many of which are in activity. Earthquakes are frequent. The principal diseases that exist in Central America are **malaria**, which is encountered in the most malignant forms; **dysentery**, most prevalent on the coast; and **yellow fever**, which is rarely absent from the ports, and occasionally invades the interior despite the altitude and lower temperature. **Relapsing fever**, **ankylostomiasis**, and other diseases of parasitic origin are not uncommon, and there is a good deal of **leprosy**.

THE ISTHMUS OF PANAMA

PANAMA, with 15,000 inhabitants, is situated on an elevated point of land jutting out into Panama Bay. The sanitary condition is bad.

COLON, the northern terminus of the Panama Railroad, is built on a swamp, and has a population of 3000. The mean annual temperature is 81° F. (27.2° C.). The rainfall is 120 inches (3100 mm.). At Naos, on the Pacific, the rainfall is about one-third that at Colon. Little rain falls from January until April. Malaria is the chief cause of mortality.

COSTA RICA

The principal ports of Costa Rica are PUNTA ARENAS, on the Pacific, and PORT LIMON, on the Atlantic. The latter is quite an attractive town, with a population of only about 200 whites and 3000 negroes. It is cleaner than most Costa Rican cities, and has wide streets, a good sewerage system, and waterworks. The streets are macadamized and kept clean. There is a quarantine station outside the city.

The climate of Costa Rica is humid. Rain falls more frequently than in the other Central American States. SAN JOSÉ and CARTAGO are the principal towns. The latter is recognized by the natives as the most healthful locality in the republic. The climate is equable. The temperature never exceeds 78° F., and rarely falls to 55° F. The interior of Costa Rica is salubrious. The coast regions, both of the Pacific and Atlantic, are frequently visited by epidemics of yellow fever.

NICARAGUA

Nicaragua is traversed by two mountain ranges, between which lies a great basin. The general level is lower than any other of the States in Central America. Near the Pacific coast are two large lakes, Nicaragua and Managua. Near the lake of Nicaragua, for 300 miles, the land has an elevation of only 100 feet above sea-level. The temperature is between 70° and 80° F., and the general salubrity is good. The capital, MANAGUA, is not high, but its situation near the lake and the ocean renders the climate cool and pleasant. The canal in course of construction lies at the extreme southern border of Nicaragua, Lake Nicaragua forming a link in the connection between the gulf and the Pacific. GREY TOWN, the eastern terminus, is marshy and unhealthful. Malaria and dysentery are the chief diseases.

HONDURAS

While the general description of Central American climates applies broadly to that of Honduras, the latter may be said to be exceptionally variable. It is a mountainous country of great extent, with a large gulf coast and a small coast on the Pacific. The coast is unhealthful. The temperature is very high. From Omoa to the Cape of Gracias a Dios particularly, the coast is hot and favorable for the prevalence of yellow fever and malaria. The interior of Honduras is cooler and more salubrious. Quite different from the coast region of Honduras is BELIZE, situated near the southern extremity of the peninsula of Yucatan. Invalids are sent thither from the West India Islands and from other parts of Central America to recover from pulmonary affections principally. The air is pure, and the average temperature is about 70° F.

SALVADOR

In this republic, which embraces two parallel ranges of mountains and an intervening valley and numerous lakes, the cities of CINCINATO and SAN MIGUEL have an unusually high temperature during the entire year, ranging from 85° to 90° F.

SAN SALVADOR, the capital, is cooler. The large towns, however,

are not situated in the high altitudes. As usual, the table-lands are healthful and the coasts malarious. There are not any especial places of resort.

GUATEMALA

GUATEMALA CITY, the capital of the largest Central American republic, is situated in latitude 15° north, 5270 feet above sea-level. It is an attractive and healthful city. The climate is agreeable, the annual mean temperature being 68° F. There is great uniformity of temperature ; no month has a lower mean than 66° F. and none higher than 70° F. There is a dry season from October to April, followed by a rainy season in which about from 55 to 60 inches of rain fall. The city of Guatemala is liable to severe epidemics of smallpox, 20,000 persons having died of that disease in 1900 (Davidson). Malarial disease is rare. Typhus is said to be unknown.

ANTIGUA GUATEMALA, the city once destroyed by the Volcan de Agua, is a pleasant place of resort. The northern part of Guatemala is very cool compared with other parts of the country and perhaps of Central America. Snow sometimes falls in QUEZALTENANGO. The northeastern part of Guatemala is considerably warmer. The entire State of Guatemala may be said to be a plateau situated about 3000 feet above sea-level. The region along the coast from Belize to Santo Tomas is very unhealthful.

THE WEST INDIA ISLANDS

These islands, situated in the Northern Hemisphere to the east of Central America, and mostly within the tropics, possess hot, moist, equable climates, and exercise a sedative, and often a relaxing, effect, tending to produce loss of appetite and chronic diarrhea. Patients who enjoy hot, equable weather and who suffer from dry catarrhal conditions of the respiratory organs, with irritable cough, such as is aggravated by residence in dry climates, may, however, sometimes derive benefit from winter residence in the West Indies, provided a healthful locality be chosen where the hygienic conditions are good.

The West Indies are all liable to hurricanes but in less degree as the South American coast is approached.

THE GREATER ANTILLES, OR LEEWARD ISLANDS

JAMAICA

Jamaica, the largest of the English Antilles, lies about ninety miles to the south of the eastern part of Cuba, in latitude $17^{\circ} 43'$ to $18^{\circ} 32'$ north, and has a warm, moist, equable climate characteristic of tropical islands. KINGSTON, the chief town, on the coast, and the low-lying parts of the island, are not very healthful, and are visited by endemic and epidemic diseases. There are, however, more elevated regions in the islands that possess a cooler climate than the coast-land, and that are comparatively free from tropical diseases. One is considered to be safe at 1400 feet. The north side of the island is reputed to be the most healthful. The range called the Blue Mountains attains a height of 7500 feet at its highest point, and NEWCASTLE has an altitude of nearly 4000 feet. At Kingston the mean annual temperature is said to be 78° F.; the mean temperature for spring, 76° F.; for summer, 80° F.; for autumn, 78° F.; for winter, 74° F. The mean annual relative humidity is 78 per cent. The mean annual rainfall averages about 55 inches. At Newcastle the mean monthly temperatures are said to range from 61° to 68° F.; at higher altitudes, from 40° to 50° F. The mean daily range at the low levels of the island is probably about 10° F. Many of the inhabitants of Jamaica leave the sea-ports with the advent of warm weather and seek the higher altitudes. During the winter the climate is so mild and relaxing as to be enervating at the sea-level to persons directly from the north.

During the winter months a strong sea-breeze (trade-wind) sets in at about 8 A.M. and continues steadily from the southeast until nearly sunset. A land-breeze from the northwest tempers the air at night. The rains usually begin in May and continue into July. Frequent showers then occur until October, when the wet season sets in again, lasting until the middle of December. It is then dry

until May.¹ Earthquakes are frequent, and hurricanes are likely to occur from June to October.

As a place of residence Jamaica is attractive. Living is not very expensive,² and at a slight elevation the climate will be found exhilarating. Nine miles from Kingston by carriage drive is GORDON-TOWN, about 1000 feet above the sea. The days here are usually bright and warm, the air is fresh and invigorating, and the nights are cool. The Santa Cruz mountains are spoken of highly for their dry, crisp, and invigorating climate. They are, however, reached with some difficulty. MANDEVILLE has an elevation of 2200 feet. Excursions may be made in various directions. A coasting steamer makes the circuit of the island every ten days, anchoring at night in its various ports.

CUBA

The Island of Cuba is 730 miles long and averages 80 miles in breadth. It lies between 74° and 84° west longitude and 19° and 23° north latitude. In area it is a little smaller than either of the States of New York or Pennsylvania. It divides the entrance to the Gulf of Mexico into two passages.

The Cuban coast is low and flat and is thus subject to frequent inundations. In the southeastern and central portions are elevated ridges with summits rising from 3000 feet (Ojo del Toro) to 7670 feet (Pico de Tarquino). The mountain ranges divide Cuba into two water-sheds, one draining north and the other south. The average elevation of the island is not very great—probably less than 500 feet.

The climate of the low coast-land is torrid, but that of the more

¹ The yearly rainfall in Jamaica varies according to location from 40 to 121 inches. The average would probably be not far from 75 inches. It is evident, from the fact that the island is in the course of the northeast trade-winds, which come moisture laden, that the greatest precipitation of rain will be on the northern slope. Imagine 75 inches of rain falling on land whose average height is between 2000 and 3000 feet above sea-level, and having a distance of but from twenty to fifty miles to run to reach the sea. Is it not clear that this body of water must flow with vast rapidity—that it becomes a torrent? (Rothrock).

² Furnished cottages may be had for about \$50 a month, and provisions and servants' wages are low. The fare from New York is \$50 on the Atlas Line, the voyage lasting

elevated interior is, by comparison, temperate. The hot and wet season lasts from May to October. From November to April the cooler and, by contrast, dry season, is experienced. During the rainy season troops not engaged in campaigning should be sheltered in barracks of some kind and avoid tent life. At HAVANA, the principal city of Cuba, situated on the northwestern coast at latitude $23^{\circ} 9'$ north, the mean annual temperature is 77° F. The annual and diurnal range is small. The highest temperature ever recorded was 100.6° F. in July, 1891, and the lowest, 49.6° F., in February, 1896; the average temperatures for these months are 72° F. and 82° F., respectively. The diurnal range in winter or summer is only ten degrees Fahrenheit. In the interior, at elevations over 300 feet, the freezing-point may be reached in winter.

The relative humidity at Havana at 8 A.M. ranges from 73 per cent. to 83 per cent. throughout the year; at 2 P.M. it ranges from 58 per cent. to 71 per cent. The rainfall at Havana is generally greatest during the months of June to October, but it has happened that four times in thirty years more rain has fallen in the so-called 'dry season' than in the 'wet season.' As a rule, however, about two-thirds of the total rainfall occurs from June to October, the average for the year being about 51 inches. Rain falls at Havana on one day out of every three. There are heavy showers, the clouds breaking away and the sky clearing.

The prevailing winds are the 'northeast trades,' which have an average velocity of about 6.5 miles an hour in summer and 8.5 miles in winter. The winds are slightly higher on the northern coast than on the southern coast. The velocity slowly increases from 4 miles at 6 A.M. to 11.4 miles at 2 P.M., and then slowly recedes. Thunder-storms are frequent, and hurricanes occasionally occur in August, September, and October. There are sometimes slight shocks of earthquake.¹

Under the military administration of the United States, Cuba is

six and one-half days. Visitors will find the residents extremely hospitable, and if a visit to Jamaica is contemplated, it will be of great value to have letters of introduction to certain families who take great pleasure in welcoming accredited guests.

¹ For additional data on the climate of Cuba see article by W. F. R. Phillips, M. D., in the report of the chief of the U. S. Weather Bureau, 1897-'98, Part VII.

being subjected to hygienic methods previously unknown there. The herculean task of cleansing its cities and harbors has been undertaken, and good results are already observable. Many lives have been lost in the performance of this duty. Almost at the outset the country was shocked at the death, from yellow fever, of the most distinguished sanitary engineer that America has produced—Colonel Waring. No doubt immense benefit will accrue from the great sanitary operations now undertaken in Havana. It is proposed to spend about eight million dollars in providing modern sewers for the city.

In the interior, malarial diseases, diarrhea, and dysentery prevail, and yellow fever, which is occasionally met in the interior, is endemic at the seaboard.

In the year 1896, when so many Spanish troops were brought to Cuba, two-thirds of the mortality among the soldiers—6610 deaths in a total of 10,191—were due to yellow fever. The deaths were distributed throughout the year, being least frequent in March and April and most numerous in October and November. In the following year, of a total mortality of 14,718, 563 died of yellow fever.

Of 19,271 deaths in Havana during 1898, in a population of about 200,000, death was due to the following causes: yellow fever, 136; typhoid fever, 1030; pernicious fever, 529; malarial fever, 1373; dysentery, 1359; enteritis, 3149; diphtheria, 21; smallpox, 186; beri-beri, 9; glanders, 8; starvation, 215; pneumonia, 317; tuberculosis, 2819. From April, 1896, to January, 1898, smallpox caused nearly 2500 deaths, almost exclusively among the natives. Smallpox has now practically disappeared from Havana, but is still epidemic in several parts of Cuba.

According to Dr. Brunner, of the United States Marine Hospital Service, the enormous death-rate from tuberculosis is a result of unhygienic surroundings—meaning unwholesome food, unclean homes, and ill-regulated lives. The great number of deaths from dysentery and enteritis he attributes to a scanty and impure food-supply.

The city of HAVANA has some attractive suburbs. VEDADO is five miles distant, and is famous for its sea-baths. These are unlike

all others in that they are excavated from the solid rock within a few feet of the water's edge. They are about ten feet square, and the water in them is about five feet deep. They are connected with the sea by short tunnels through which the water dashing in is constantly renewed. MARINAO is seventeen miles from Havana, and has a high situation. It is reached by a short drive from the beach, where there are ample opportunities for bathing and sailing. In the palmy days of Cuba, Spaniards and Cubans frequented SAN DIEGO DE LOS BAÑOS, near Havana, on account of the springs and baths, which have a reputation for the cure of **rheumatism**.

Situated within the tropics, Cuba is suitable for northern visitors only during a few months in the winter, and even then it is desirable to leave the unhealthy seaports at once and seek the beautiful suburbs, where the most magnificent estates are found.

THE ISLE OF PINES

The Isle of Pines, lying south of Cuba, formerly had a good reputation among the Spaniards and Cubans as a health resort. Before the war a military hospital was established by the Spanish Government at a small village called NUEVA GERONA. This village is protected by mountains. The soil is sandy, and the island is famous for its pines. A large number of cases of **pulmonary tuberculosis** have been sent to this island by Spanish physicians, and good results are reported.¹

PUERTO RICO

The chief town of Puerto Rico is SAN JUAN. It is situated in latitude 18° north, and has a mean annual temperature of 80° F. The maximum has never been above 92° F., and the minimum has never been so low as 57° F. The precipitation varies from 45 to 82 inches, and the relative humidity ranges from a monthly mean of 72 to 85 per cent. The climate has been found quite enervating by American troops. One of the medical officers of the United States army contracted Malta fever there in 1888, an affection that

¹ "Memoir on the Salubrity of the Isle of Pines," by Dr. Don José de la Luz Hernandez, Havana, 1867.

baffled medical experts for a long time until the diagnosis was established by bacteriologic culture. There is a well-equipped army hospital on the island.¹

HAITI

PORT-AU-PRINCE, the capital and chief city of Haiti, is one of the most unhealthful cities in the world. It has a population of about 35,000, and only 1000 of these are whites. The ditches along the streets carry the surface drainage into the harbor, where it stagnates under the hot sun. The tide is sluggish, and the slimy mud is pestilential.

"**Haitien fever**" is endemic, and is considered by Surgeon A. M. Moore, U.S.N., to be a form of yellow fever modified by race and acclimatization.

THE BAHAMA ISLANDS

The Bahamas are a group of British islands between 21° and 28° latitude north, to the north of Cuba and Haiti, and to the east of Florida. They are easily accessible by steamer from Miami, Fla., from which they are distant about 200 miles. The highest hill in these low-lying islands attains a height of only 230 feet above sea-level. They enjoy a reputation for healthfulness, and the mortality is under 18 in 1000. NASSAU, the capital, is situated on porous soil, on a slope facing a harbor on the north of New Providence Island, in latitude 25° 6' north. Its population is about 16,000. There is a good hotel for winter visitors. There are about 700 islands in the group; twenty-five of these are inhabited. The Bahamas possess a warm marine climate, moist and equable—much like that of Madeira. The mean annual temperature is 76° F.; that of spring, 75° F.; of summer, 81° F.; of autumn, 77° F.; of winter, 71° F. The temperature of the coldest day ever recorded was 55° F., but the air may be quite chilly during a long winter storm. The relative humidity in winter is 83 per cent., and in spring, 76 per cent. The mean annual rainfall is 56 inches, occur-

¹ For an account of the climatology and diseases of Puerto Rico see article by Colonel Charles H. Alden, M. D., U. S. A., "Transactions of the American Climatological Association," 1901.

ring chiefly from May to October. The temperature of the sea-water near Nassau is usually about 70° F. at any time of the year.¹

The vegetation is tropically luxuriant; figs, olives, oranges, bananas, pineapples, and other fruits abound, and the myriads of sea-birds and wonderful fisheries are attractive to the visitor. The climate is suitable for **convalescents** from acute diseases, and as a winter resort for some cases of **irritative affections of the respiratory tract**, but is unsuitable for cases of pulmonary tuberculosis or of rheumatism.

THE LESSER ANTILLES, OR WINDWARD ISLANDS

TRINIDAD

Trinidad, the most southern of the British West Indian islands, is twenty-four hours distant from Barbados. It lies between latitudes 10° and 11° north, only seven miles from the Continent of South America. It extends fifty miles north and south, by thirty east and west. It has a moist, equable climate, and is unhealthful and relaxing, although its hills, which attain an elevation of 3000 feet, are more wholesome. The mean monthly temperatures range apparently from about 69.4° F. to 87.2° F. The mean annual temperature is 78.3° F.—warmer than that of Funchal in Madeira by about 13° F. The mean annual rainfall is about 70 inches, and there is a rainy season during the summer months. The island is famous for its palms and the beauty of its flora in general.

BARBADOS

Barbados is a populous British island situated at $13^{\circ} 10'$ latitude north. Its climate is somewhat similar to that of Jamaica, but it has no high mountains, and is more healthful and almost free from malaria. The highest hill is MOUNT HILLABY, only a little over 1100 feet above sea-level. The mean monthly temperatures range from 76° F. in January to 80° F. in August. The mean annual relative humidity is 72 per cent. The mean annual rainfall is 57 inches, but there is comparatively little rain between December and May, and

¹ See S. E. Solly, "Medical Climatology," 1897, p. 436.

no sudden or disagreeable atmospheric changes occur during that season. At other times hurricanes may visit the island, and there is often continued rainfall. The soil is adapted for the cultivation of sugar-cane. The most suitable place for visitors is HASTINGS, two and a half miles east of BRIDGETOWN. The latter is entirely unsuitable for a residence, being the port at which the steamers land. In the winter or spring, Barbados is a good resting place between ships for those taking the Caribbean voyage.

OTHER ISLANDS OF THE WINDWARD GROUP

ST. LUCIA is a beautiful island and conspicuous by the two peaks that rise abruptly from the sea to the height of 2700 feet. The island is thirty-five miles long and twelve miles wide.

ST. KITTS is an island of great beauty and fertility, and is ten miles south of St. Eustatius. Its principal town, BASSE TERRE, is situated in a valley at the foot of high mountains, one of which, an extinct volcano, rises to a height of 4300 feet. In January, 1880, a great flood poured down from the deep ravines and gorges upon its side, sweeping away houses and beautiful estates and drowning nearly 200 people. Such cloud-bursts are of great rarity. ANTIGUA, GUADALOUPE, ST. KITTS, and all these islands are volcanic and of great fertility.

DOMINICA is a picturesque island twenty-seven miles long and thirteen miles wide. It is mountainous, the summit of Morne Diablotin reaching a height of 4747 feet. The Rosseau valley is famous for its beauty and for its boiling springs.

MARTINIQUE,¹ called by the natives Mandiana, is forty-three miles long and from twelve to twenty miles wide, and has an area of 380 square miles. A mountain knot in the north that rises to a height of 4430 feet, and another in the south are connected by a low ridge, all being densely covered with trees. The coasts of the island are irregular and high, except on the west, where stand ST. PIERRE and FORT DE FRANCE. The former has the best hotel in the West Indies. The mean annual temperature is about 70° F.

¹ Population in 1888, 175,391, of whom only 10,000 are white. St. Pierre, population 20,000; Fort de France, 15,000.

Martinique, St. Kitts, and other islands of the Windward group will long be memorable for the terrific earthquakes and cyclones that have smitten them. Not an island in the West Indies has escaped these scourges; their cities have been ruined, plantations devastated, and tens of thousands of lives lost. Cyclones break with such fury and so unexpectedly that shipping has sustained some frightful losses. In the cyclone of August 18, 1891, Martinique was devastated as it had not been for half a century; not one of the fifty vessels in the harbor of St. Pierre was saved; over 400 people lost their lives, and the damage to property was estimated at ten million dollars.

It is customary for steamers entering these West Indian ports in August and September to keep up steam so that at a moment's notice they may get under way and seek the open sea, where they are not in such danger of being dashed to pieces.

The United States Government has established weather stations at Puerto Rico, and in cooperation with the outposts of the Windward group it is hoped that warning may be given of impending disasters.

THE BERMUDA ISLANDS

This group of small islands lies in the North Atlantic Ocean, between latitudes $32^{\circ} 15'$ and $32^{\circ} 25'$ north—about on the same line as Charleston, S. C., and 600 miles to the east of the coast of the United States—Cape Hatteras. They are 700 miles southeast of New York. The largest of these islands, GREAT BERMUDA, is only fifteen miles long, and, as one might suppose, the climate is warm, moist, and very equable. Although they are not subject to extreme heat, frost and snow are unknown in these islands. The Gulf Stream passes between Bermuda and the American coast, and thus modifies any cold atmospheric currents coming from the Continent. In summer the temperature rarely exceeds 87° F. and in winter it is never lower than 50° F. The mean annual temperature is 69° F. The daily range in winter is 8° or 10° F. The mean relative humidity is high,—more than 80 per cent.,—but the skies are usually bright, and fogs are rare. The mean annual rainfall is 50 inches, but the soil is a disintegrated porous coral rock

that readily absorbs all rain. There are no fresh-water ponds or marshes. Malaria is not found. The country is picturesque, and the harbors afford fine opportunities for sports. There are good roads and most productive farms. There is also some opportunity for profitable employment in Bermuda. The chief industries are the growth of onions and potatoes for the New York market ; but the beautiful Easter lily is also a source of profit to a large number of the inhabitants. Over a hundred flowers have been known to burst from a single plant, and with the advent of spring the fragrance of the myriads of blossoms pervades the entire island.

Bermuda has become a decidedly fashionable winter resort. Great benefit may be derived from a visit, but to be enjoyed thoroughly, the visitor must have abundant means. There are opportunities for driving, fishing, and sailing, and while there are short showers, it is quite unusual for the sun to be obscured for any length of time ; consequently out-of-door life can be thoroughly enjoyed.

In summer and early autumn the air is usually oppressive from the moisture of the tropical wind ; in the colder half of the year the weather is likely to be damp and variable. This dampness is more noticeable as darkness comes on. After nightfall invalids are not able to be out-of-doors with safety in the colder season.

Following is a comparison of relative humidity at Bermuda and other stations :

TABLE OF MEAN RELATIVE HUMIDITY—PERCENTAGE.

PLACE.	ANNUAL.	NOV.	DEC.	JAN.	FEB.	MARCH.	APRIL.
Bermuda,	73.4	72.2	72.0	75.0	76.5	77.0	77.1
San Diego,	72.9	66.4	67.2	71.2	74.3	75.5	72.4
Jacksonville,	72.0	74.8	73.7	74.6	70.6	65.4	67.2
Nice,		62.4	63.0	65.9	59.9	55.7	60.4
New York,	69.7	69.6	72.4	72.4	72.0	67.6	64.8
Chicago,	70.8	70.8	73.9	76.0	72.5	71.5	66.5
Boston,	69.6	70.5	72.7	71.8	69.6	69.4	64.8

The climate is too moist to be of value in the treatment of tuberculosis in general, although occasionally useful in individual cases, especially when the patient is subject to hemorrhage, and must therefore avoid very dry air, and is too much debilitated to bear

constant cold. It is to be avoided by the rheumatic and neuralgic. It is especially suitable as a refuge in the late winter or early spring, after an exhaustive social season or business strain; it is a good place for general rest and recuperation, especially for those who find northern winters too cold and who suffer from the sudden changes of temperature that are common in the north as winter merges into spring. The climate of Bermuda is suited to those **convalescing** from acute illness, for **nervously excitable** individuals and **neurasthenics**, and for those suffering from **bronchitis**, **nephritis**, or **insomnia**.

The Hamilton and the Princess are two excellent hotels, but there are many private boarding-houses at which rates are reasonable.

Bermuda is a British naval station, and the presence of officers of the army and navy has a marked influence on the social attractions of this resort.

The frequency of deaths from phthisis is about the same in Bermuda as in southeastern Pennsylvania, or one death annually to every 400 inhabitants. It should be mentioned, however, that a large majority of the 16,000 inhabitants are negroes.

The voyage from New York, while short, is not infrequently rough, and this should be recognized in planning a trip for invalids.

CHAPTER XVI

CLASSIFICATION OF THE CLIMATES OF CANADA, THE UNITED STATES, MEXICO, AND NEIGHBORING ISLANDS

Marine Climates. Coast Climates. Inland Climates of Low, Moderate, and High Elevations. Available Mountain Stations.

Chapters XVI to XXVIII of Part II, dealing with the principal stations of North America, are contributed by Dr. Hinsdale.

We shall now take up the health resorts and some of the principal towns in North America, beginning with the Dominion of Canada, then considering the United States, and concluding with Mexico.

In a general way the resorts considered in this portion of the present work, and some of those described in a previous chapter, may be classified as indicated under the following heads :

MARINE CLIMATES :

Warm sedative : Bermuda ; the Bahamas ; the West Indies—Havana and other cities of Cuba, Puerto Rico, and Jamaica.

Moderately cool : The Channel Islands of California.

Cool stimulant : Long Island ; Nantucket ; Martha's Vineyard ; the extremity of Cape Cod ; the Isles of Shoals.

Cold stimulant : Newfoundland ; Cape Breton ; Nova Scotia ; Campobello ; south shore of Mount Desert.

COAST CLIMATES :

Warm sedative : The shores of South Carolina, Georgia, Florida, and the gulf of Mexico ; San Diego ; Coronado.

Cool stimulant : The New Jersey coast ; Lakewood ; resorts on Long Island Sound and Narragansett Bay ; western end of Cape Cod ; the 'North Shore' of Massachusetts ; the coast of New Hampshire and Maine ; San Francisco.

Cool sedative: Portland, Oregon; Tacoma, Seattle, Olympia.

INLAND CLIMATES:

Low elevation (0–1500 feet):

Warm and moist: Louisiana; eastern and central Texas; Mississippi; eastern Arkansas.

Warm and dry: Aiken, South Carolina; Thomasville, Georgia; Phoenix and Salt River valley, Yuma, Arizona; Redlands, Riverside, San Bernadino, Pasadena, San Gabriel, Ojai valley, California; the lake district of the interior of Florida during the winter.

Moderately warm and dry (but liable to severe cold in winter): The pine region of New Jersey.

Desert climate: The Mojave Desert.

Cool and moist: The valley of the St. Lawrence; northern California and western Oregon and Washington—not on the coast.

Cold and moist: Winnipeg, Port Arthur, Sault Ste. Marie, Duluth.

Cool and moderately dry: Southern Minnesota, North and South Dakota, the Muskoka Lake region in Ontario, the southern tier of counties in New York, and the adjoining counties in Pennsylvania; the pineries in Wisconsin and central Michigan; northwestern Connecticut; the Berkshire district in Massachusetts.

Moderate elevation (1500–4000 feet):

Warm and dry: Mesilla and Lower Pecos valley; Las Cruces; southern New Mexico, Guadalajara, and Monterey, Mexico; southern Arizona; portions of southeastern California near the Sierra and Coast ranges.

Moderately warm and dry: Asheville, North Carolina.

Cool and dry: Eastern Oregon and Washington; the valleys of Idaho and Montana; southern Wyoming; El Paso, Texas.

Cool and moist: The Adirondack Mountains, New York; the White Mountains, New Hampshire; Mount Kineo, Maine; Eaglesmere, Pocono, Pennsylvania; Deer Park, Maryland; western Virginia and North Carolina.

High elevation (4000+ feet):

Warm and dry: Northern New Mexico; central Mexico; southern Colorado; northern Arizona.



W.F.B. Phillips

Areas enclosed in red, altitude of 3000 ft. or above.

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Cool and dry: Denver, Colorado Springs, Manitou and mining regions of Colorado, Montana, and Idaho; The Yellowstone Park, Lake Tahoe, Nevada; Glacier, Field, Banff, Calgary, Rossland, in British Columbia.
Cool and moderately moist: Roan Mountain, North Carolina; Mountain Lake, Virginia.

Following is a condensed list of the chief **mountain stations** in the United States now available as health resorts:

In **northern Maine**: Mount Kineo, Katahdin Iron Works, the Rangeley Lake Region, Mount Desert. In **New Hampshire**: The White Mountains. In **Vermont**: The Green Mountains. In **Massachusetts**: The Berkshire Hills. In **Connecticut**: The hills in the northwestern corner. In **New York**: The Adirondacks, the Catskills, the Shawangunk Mountains. In **Pennsylvania**: The Pocono Mountains, the whole of Pike, Sullivan, and Monroe Counties in the northeastern corner of the State; Kane, McKean County, Cresson, and the Alleghanies. In **Maryland**: Deer Park. In **Virginia**: Hot Springs; Mountain Lake. In **North Carolina**: Asheville; Hot Springs. **Arkansas**: Hot Springs; Ozark Mountains. **The Rocky Mountain region**, including various stations in Colorado, New Mexico, Wyoming, Montana, Idaho, Nevada, and Utah. In **California**: The various stations in the Sierra and Coast ranges; which ranges also include stations in **eastern Oregon** and **eastern Washington**.

Few localities in the United States or Canada can claim a fixed climate under all conditions. The season of the year, the tendency to variations in a particular season, and the individual standpoint of the visitor enter so largely into the estimate of any given place that differences of opinion will always exist. The healthfulness of any station is also an uncertain quantity. A health resort of good repute may lose its prestige by reason of the presence of yellow fever or malaria. It is not intended to present here the various American climates from a meteorologic or technical viewpoint, but to deal with them practically in their therapeutic relations. Many stations, some of them of undoubted value, will necessarily be omitted; yet it is hoped that the general field will be found to be well covered.

CHAPTER XVII

HEALTH RESORTS IN THE DOMINION OF CANADA

General Features of Canadian Climates. Health Stations in Canada. The Adjoining Canadian Provinces—Cape Breton. Nova Scotia. Newfoundland. Prince Edward Island. British Columbia and Alberta.

GENERAL FEATURES OF CANADIAN CLIMATES

The provinces of **Quebec** and **Ontario**, stretching from Labrador and the gulf of St. Lawrence on the east, to Lake Superior and Manitoba on the west, present wide differences in respect to climate. Throughout this region there is, as a rule, a short summer followed by a rigorous winter. Although Quebec is nearer the ocean, Ontario is the more favorably situated, much of its area stretching below the 45° parallel. **TORONTO** is at the same degree of latitude as Portland, Maine, and the extreme southern limit of Ontario is upon the shore of Lake Erie. The great lakes exert a strong influence on the climate of Ontario, insuring less severe extremes of temperature and a more abundant rainfall than in **Manitoba**, **Assiniboia**, **Saskatchewan**, **Athabasca**, and the **Northwest Territory**. The lower lake region and the St. Lawrence valley are the most frequent paths of storms. Hence this region experiences a large percentage of cloudy days and a comparatively heavy precipitation. The rainfall increases from the interior to the coast. The highest average of yearly rainfall is at Cape Breton, where it reaches 55 inches. Halifax has 43 inches; Sydney, 49; Montreal, 27; Quebec, 19; Ontario, Toronto, 29; Barrie and Peterboro, 20; Manitoba, Winnipeg, 16; and Spence's Bridge, in British Columbia, only 4 inches.

The low temperatures recorded in winter in Ontario are comparable with those obtained in Michigan and the northern portions of **York** and New England. The winters are characterized by **cold, a heavy snowfall, and at least three months of sleigh-**

ing. In Quebec the snow begins to fall in November and lasts for about five months. Canadian winters, while intensely cold, are not attended with the discomfort that might be expected from a consideration of temperature records alone. The dry, bracing atmosphere renders the coldest days frequently the most enjoyable and invigorating. The freedom of the interior districts from the easterly winds and damp fogs of the coast, as well as from the sharp changes of weather so common in the United States, robs the winter of many of its terrors.

The most attractive season to visit MONTREAL is midwinter, when the gay ice carnival draws thither large numbers of visitors. At this time an abundance of snow and ice is essential to pleasure, and the supply is ample. Snow in Canada protects the grain and facilitates transportation. It is, indeed, indispensable to the great lumber interests, and renders the remote regions in the north accessible.

Snow varies greatly in amount, but averages 115 inches in a year in Quebec, 112 inches at Prince Edward Island, 62 inches in Manitoba, and 33 inches at Spence's Bridge, British Columbia. It usually first begins to fall in October throughout the interior provinces, but occurs somewhat later on the coast.

Malaria prevails to a slight extent on the northern shores of Lake Erie and in the flat regions in the neighborhood of Lake St. Clair. There is none on the shores of Lakes Ontario, Huron, and Superior. It has largely disappeared from the province of Quebec in the regions drained by the broad St. Lawrence. It is not seen to any appreciable extent in the northwest and Pacific provinces.

HEALTH STATIONS IN CANADA

ONTARIO

Two miles from the town of GRAVENHURST, on the northern division of the Grand Trunk Railway, 115 miles from Toronto, is situated the Gravenhurst Sanatorium for the treatment of **tuberculosis**. It has an altitude of nearly 800 feet, and is on the shores of LAKE MUSKOKA. The building is in a beautifully wooded park of fifty acres, and is sheltered from north and northwest winds by rocky ridges and pine forests. The soil is porous, dry, and of rocky formation, of the Laurentian system. The water is soft. The

climate is bracing, and the region is considered favorable for the relief of **asthma** and **hay-fever**. The present sanatorium accommodation is for fifty patients in the incipient stage. The results of treatment have been encouraging, the last report showing 21 per cent. of apparent cures, besides 32 per cent. of cases in which the disease was arrested. A longer stay than three months is necessary, even in the earlier stages. Most of those discharged with the disease arrested have returned to their work, while others have taken up out-of-door work, such as farming.

TORONTO (latitude $43^{\circ} 40'$ north) lies on a slope that extends from its northern confines to its southern extremity on the Lake Ontario front. On the east and west it is drained by the Don and Humber Rivers. Toronto has 230 miles of sewers. There is no malaria; indeed, this is but rarely met with in Canada.

QUEBEC

In the province of Quebec, about one mile from **STÉ. AGATHE DES MONTS**, the **Laurentian Sanatorium** for the treatment of tuberculosis has recently been inaugurated. Ste. Agathe is sixty-four miles from Montreal, and is largely built up with summer residences. The institution is about midway on the declivity of a hill, at an elevation of 1550 feet. The soil is very porous; the drainage thorough. The **LAURENTIANS** have been called the 'Adirondacks of Canada,' having many of the features, physical and climatic, of that celebrated plateau, their average elevation being about 1500 and 1800 feet respectively. The immense pine forests, together with the moderate temperature, constitute the chief characteristics of this Canadian district.

THE ADJOINING CANADIAN PROVINCES

CAPE BRETON

The island of Cape Breton is a seacoast summer resort in eastern Canada. The climate is cool, and the humidity is high. It is unsuitable for the **tuberculous**, but is attractive for **overworked** business men, **neurasthenics**, and those who enjoy a marine climate. Fresh-water lakes render the country extremely picturesque.

NOVA SCOTIA

Nova Scotia is a peninsula with a cool ocean climate. It is a favorite resort of the tourist in summer. The climate is too damp for invalids, but a summer voyage to Nova Scotia is refreshing to the **overworked**, and the scenery is the main attraction. Sufferers from **hay-fever** find immunity at the usual resorts of Nova Scotia. Warm clothing is imperatively demanded.

HALIFAX (latitude 45° north), a fine seaport on the ocean side of Nova Scotia, is interesting for its citadel and fine view of the harbor. The town is British in manners, customs, and sympathies. It is a good resort for those suffering from **hay-fever**, and makes a convenient destination for those desiring a short northerly ocean voyage from the United States. The climate is cold and damp, and fogs are common.

NEWFOUNDLAND

This large island lies east of Canada, between 47° and 52° north latitude. It is the nearest point to Europe on the American coast. Its southern extremity, CAPE RACE, is in the same latitude with northern Michigan and Seattle, Washington. ST. JOHNS, the principal city, is situated on a peninsula, with a well-protected harbor, from which steamers leave for Quebec, New York, Baltimore, and for the coast of Labrador. The cliffs rise to a height of 500 feet, affording the most picturesque scenery. There are various interesting trips by water from St. Johns.

The climate of Newfoundland is cold and damp, and unsuitable for persons unaccustomed to the bleak shores of the northeastern coast. The mean annual temperature is 41.4° F. The mean monthly temperatures (Fahrenheit) beginning with January are as follow : 25.6° , 22.7° , 28.7° , 33.3° , 43° , 50.7° , 60.3° , 60.1° , 55.8° , 49.6° , 38° , 28.9° .

The isotherm passes through Montreal, Marquette, Michigan, northern Minnesota, and North and South Dakota. The annual rainfall is over 50 inches ; the mean relative humidity over 80 per cent. ; and the annual cloudiness over 60 per cent. The summer is the only desirable season for visiting Newfoundland, and even then provision must be made for cold weather. Men suffering from

nervous depression or mental fatigue, who might be interested in sport or in the remarkable scenery of the region or who would escape **hay-fever**, constitute the class of cases likely to receive benefit from such a trip.

PRINCE EDWARD ISLAND

Prince Edward Island, called the 'Garden of the Gulf,' is north-east of Cape Breton Island, and is reached by the Intercolonial Railway or by steamer. There are good accommodations at CHARLOTTETOWN and good fishing and shooting in the vicinity. The climate is cool, and fogs are likely to occur, but the air is stimulating and the scenery is fine.

MANITOBA

WINNIPEG, 1424 miles west of Montreal, at an elevation of 700 feet, has a population of 45,000. It is a substantial city, the capital of the province of Manitoba, and the chief post of the Hudson's Bay Company. Its climate is remarkable for the great annual range of temperature, amounting in 1899 to 135.9° F. The mean temperature is lower than that of any other large city in America—viz., 34.2° F. The lowest sun temperature was —16.5° F., and the lowest recorded in the shade was —46.5° F. The maximum is 90° F. There is no malaria, but in the woods mosquitos and black flies are formidable pests. The climate is stimulant and is especially dry during the colder six months of the year.

BRITISH COLUMBIA AND ALBERTA

BANFF is in the Canadian National Park in **British Columbia**, on the eastern slope of the Rocky Mountains. The elevation of the hotel is 4500 feet, and it overlooks the Bow and Spray Rivers. The scenery is inspiring and the atmosphere exhilarating. Fishing grounds are easily accessible. The locality is said to be exempt from **hay-fever**. Hot sulphur springs, varying in temperature from 80° to 121° F., are used in the treatment of **rheumatism**. While the hotel is not intended as a sanatorium, there is an excellent equipment, and provision is made for the comfort of invalids.

FIELD, fifty miles west of Banff, is a favorite stopping-place for

tourists. The altitude is 4050 feet, and the site commands a fine view down the valley. There is an excellent chalet hotel near the base of Mt. Stephen and facing Mt. Field.

GLACIER, eighty-four miles west of Field, has an altitude of 4122 feet. The scenery is inspiring. Game is abundant, and there is much to interest the visitor.

Banff, Field, and Glacier are at about the same altitude and are in practically the same climate. These places have not as yet been described as health resorts, but merely as attractive railroad stations in the mountains. They are suitable in summer for persons who need a stimulating climate at a moderately high elevation. **Neurasthenics** who can appreciate mountain scenery and can afford the trip will be greatly benefited in the Canadian Rockies. The advantages that these stations possess are that the number of invalids who visit them is small, and the railroad ownership of the hotels or chalets insures the best of accommodations.

KAMLOOPS is in a broad, open valley between the Gold and Coast ranges of mountains. The elevation is 1100 feet, and the air and soil are remarkably dry. The annual temperature is 46.3° F. The mean daily range in August and September is from 28° to 30° F. Kamloops has an exhilarating climate, and is favorable for the **tuberculous** during the warmer months. It is reached by the Canadian Pacific Railway, and the accommodations are said to be good.

CALGARY, in the province of Alberta, is 840 miles west of Winnipeg, and has an elevation of 3500 feet. The climate is dry and bracing. The mean annual temperature is about 37° F. **Tuberculous patients** who are fairly robust find at Calgary a cool, stimulating climate suitable for them during the warmer months.

CHAPTER XVIII

THE RESORTS OF THE UNITED STATES OF AMERICA—THE NEW ENGLAND STATES

Maine and the Islands off the Coast. The Coast of New Hampshire and the Neighboring Island Resorts. Massachusetts and the Adjacent Coast Resorts. Rhode Island and Narragansett Bay. Interior Resorts of Maine, New Hampshire, Vermont, Massachusetts, and Connecticut.

Although New England is a small district, it possesses a diverse topography and wide differences of climate. The mountains of Maine, New Hampshire, and Vermont are not surpassed in grandeur by any heights east of the Rockies, while the unusually interesting and picturesque coast is beyond comparison throughout the United States.

The New England climate is changeable, owing to its proximity to the St. Lawrence valley, a favorite route of cyclones. The storms with attendant cloudiness, the long winters, and the frequency of fogs on the extreme northeastern coast render the climate of the New England States rather unsuitable for delicate persons during a large portion of the year. But during the summer months the cooler air of the mountains and the seashore and the attendant diversions of summer resort life attract many visitors from all portions of the United States and Canada.

MAINE AND THE ISLANDS OFF THE COAST

CAMPOBELLO (latitude $44^{\circ} 57'$ north), just beyond the border of the United States, is a picturesque island in Passamaquoddy Bay, seventy miles northeast of Mount Desert, and three miles from Eastport. It is a favorite summer resort and has a cool and bracing climate.

In Washington County, the easternmost part of the Maine coast, hunting and fishing camps are numerous. There are hundreds of streams abounding in trout and salmon, and deer are frequently

seen. Always cool in summer, it is a region of intense cold during the winter. The air is sharp and invigorating. The principal camps are at CHERRYFIELD, COLUMBIA FALLS, MACHIAS, EAST MACHIAS, and FRANKLIN. These camps have a capacity of from ten to fifteen guests, and the rates charged are, as a rule, one dollar a day. Further information at to camps and guides can be obtained from the Game Warden of Washington County.

MOUNT DESERT ISLAND lies close to the northeastern end of the Maine coast. Its coast is rocky and indented by numerous bays. The climate is invigorating, cool, with abundant rain and occasional fog. The air is too chilly and damp even in summer for very delicate persons or those suffering from pulmonary or catarrhal affections. It is suitable in *neurasthenia*, *insomnia*, and *convalescence* from chronic illness, and for *recuperation* from general nervous and mental fatigue. Exemption from *hay-fever* has been noticed in some patients at Northeast Harbor. Although Mount Desert is not over sixteen miles in diameter, it possesses thirteen mountains and thirteen lakes. GREEN MOUNTAIN, the highest summit, has an altitude of 1500 feet. The principal harbors are BAR HARBOR, NORTHEAST HARBOR, SOUTHWEST HARBOR, and SEAL HARBOR. These are all popular resorts for three or four months in the year. Bar Harbor attracts most visitors and is the most fashionable resort, but the others have superior natural advantages and are far less expensive for visitors. Bar Harbor is well provided with physicians. It has six hotels and a large number of cottages. The latter rent for from \$600 to \$3000 for the season. The following table gives the temperatures in degrees Fahrenheit observed at Bar Harbor during the summer of 1899:

	JUNE.	JULY.	AUGUST.
Maximum,	85	88	88
Minimum,	59	44	45
Maximum daily range,	35	34	32
Minimum daily range,	14	12	13
Average daily range,	24.4	23.5	23.2

The annual range in 1899 was from -10° F. to 88° F. The mean temperature for June was 62.5° F.; for July, 65.6° F.; for August, 62.9° F.; and for September, 56.5° F. The rainfall for the year was 43.79 inches; 6.5 inches fell in July, while June and

August were dry months. Snow falls from November to March inclusive, and amounts to about sixty inches.

FRENCHMAN'S BAY, lying north of Mount Desert Island, is about eight miles broad, and is an occasional anchorage for warships.

WINTER HARBOR is reached *via* Bar Harbor, and has an attractive, well-kept hotel on Grindstone Neck, a portion of the mainland. There is a superior club-house, and the harbor affords good anchorage. Excellent medical attendance can be had throughout the season.

CASTINE is a picturesque town with a fine harbor near the head of Penobscot Bay. The remains of Fort Castine and Fort George and the almost forgotten sites of batteries that played an important part in all the wars of the Colonial and Revolutionary periods give it unusual interest. There are a few moderate priced hotels, numerous cottages delightfully situated, and a park of woodland that has, fortunately, been preserved in its original beauty. The climate is decidedly cool. There are strong breezes from the west and south throughout the summer, and not infrequent fogs. The effect of the air is stimulating ; it is too chilly and damp at times to be suitable for laryngeal or pulmonary cases, but is invigorating to the overworked and the languid. During August, 1899,¹ the average temperature at 8 A.M. was 62° F.; at 3 P.M., 69.1° F.; and at 8 P.M., 61° F. The weather was fair on nineteen days and foggy on eight days. The wind came irregularly from all points of the compass. July was much clearer, and the temperatures were about the same. Comparative records showed Castine slightly cooler than Bar Harbor. Castine is reached *via* rail to Belfast or Rockland, and thence by boat ; or direct by boat from Portland on certain days of the week.

ISLESBORO is an island situated in Penobscot Bay, Maine, and is reached *via* Rockland and Dark Harbor. At the southern end there are many handsome cottages and a well-kept hotel—the Islesboro Inn. GILKEY'S HARBOR affords good anchorage and opportunity for yachting in the neighboring waters. The situation of Islesboro between the eastern and western portions of the bay in-

¹ Personal observation of Dr. Hinsdale.

tures cool, fresh breezes, even at times when the mainland is hot. There is no elevation on the island of above 200 feet, but there are woods and good roads, golf-links, and other attractions. The southern end of the island is controlled by a company of Philadelphia and Boston gentlemen, by which all undesirable features are excluded. The climate of Islesboro is insular, cool, and somewhat windy, owing to the strong southerly breezes that almost invariably rise before noon. There are frequent strong northwest winds. Fogs are also likely to occur in connection with southerly winds. The soil is very porous, and free from clay. The rocks about Penobscot Bay are trap and other igneous rocks. The trees consist chiefly of white birch, spruce, hemlock, and a few pines. The summer is short and unproductive.

ISLE AU HAUT, VINAL HAVEN, and DEER ISLE lie at the mouth of Penobscot Bay, eastward from Rockland. They are not so accessible as the resorts previously referred to, but they are picturesque and possess a delightful summer climate. They are reached by steamer from Rockland and Southwest Harbor. These islands are gradually becoming better known as desirable summer stations.

CAMDEN, on the west side of Penobscot Bay, is an attractive town, and is connected by trolley with Rockland. The shore above Camden is a choice site for summer cottages. The mountains behind are conspicuous on the coast. The soil is dry and rocky, and the headlands are covered with spruce and pine.

KENNEBUNKPORT is about half-way between PORTLAND and PORTSMOUTH, and combines several attractive features as a summer resort. There are about seventy cottages on CAPE ARUNDEL and on the Kennebunk River. There is good surf bathing; the river affords fine opportunities for rowing and canoeing; there are a boat club and a golf club, a casino, a few small hotels, and good railroad connections. Kennebunkport is noted for its good society. Climatically, it is not excelled on the New England coast. The south and southwest breezes are from the water; a hot land-breeze is a rarity, and fogs are not of frequent occurrence. During July, 1900,¹ there

¹ Personal observation of Dr. Hinsdale.

was an average temperature at 8 A.M., of 67.2° F. ; at 2 P.M., 71.7° F. ; at 8 P.M., 67.2° F. During August the corresponding records were 67°, 70°, 64° F. The maximum exceeded 80° F. four times for July and twice for August, although the summer was unusually hot. Kennebunkport thus has a stimulating, cool climate, well suited for out-of-door life in summer, and adapted for those who require rest from **overwork**, with ample diversions and opportunities for activity in healthful recreation. **Neurasthenics** or those suffering from **insomnia** or **melancholia** would find cottages preferable to the small hotels. As a rule, these are well kept, but the gaieties of the younger guests at summer resorts are not always enjoyed by semi-invalids and others who should retire early.

The neighboring seashore resorts of OGUNQUIT, PASSACONAWAY, YORK BEACH, YORK HARBOR, KITTERY, and PORTSMOUTH are delightful and present varying features. The gayest of all is the well-managed and delightfully situated WENTWORTH HOTEL, near Portsmouth and Newcastle. This is purely a pleasure resort, open for about ten weeks during the summer. There is a good harbor for boating and bathing. The average summer temperature is seven degrees warmer than at Eastport, Maine, and the sunshine, averaging 52 per cent. of the possible, is greater than at more easterly points.

THE COAST OF NEW HAMPSHIRE AND THE NEIGHBORING ISLAND RESORTS

New Hampshire, the 'Granite State,' presents remarkable attractions to both the tourist and the health-seeker. It contains the most famous mountain region of New England, and many of its resorts are of world-wide reputation. Its climate, like that of Maine, is twofold, one division a low seaboard and the other, the renowned White Mountains. The fact that it has only eighteen miles of coast-line and that the low, level tract extends only about thirty miles inland accounts for the lower rate of deaths from pulmonary tuberculosis as compared with the neighboring State of Maine. In the latter State, in 1898, phthisis caused 11.3 per cent. of all deaths, while in New Hampshire, in the same year, only 9 per cent. were from this cause, the rate being higher toward the

coast and lower as the mountains are approached. This is a reduction of over one-third since 1884, and while the climate is, no doubt, the same as it has been, should point strongly to the value of the summer health resorts of the Granite State.

THE ISLES OF SHOALS are reached from Portsmouth, and offer, at convenient access from Boston, an insular, marine climate, with excellent accommodations. It was a favorite resort of the late Dr. Henry I. Bowditch in cases of early phthisis.

RYE BEACH is reached by trolley from Portsmouth or by rail from North Hampton, N. H. It is a quiet, healthful resort, with good surf bathing, ample accommodations, and delightful country drives. The air is somewhat warmer than on the Maine coast. The class of visitors at Rye Beach and LITTLE BOAR'S HEAD, its neighbor, makes these places especially attractive.

The southeastern coast of **Massachusetts**, embracing CAPE COD, is noted for its delightful marine climate, its picturesque sands, its ponds of fresh and salt water, its bays, its delightful surf bathing, and its unending opportunities for seaside diversions. The historic associations clustering about PLYMOUTH ROCK, BUZZARD'S BAY, FALMOUTH, YARMOUTH, CHATHAM, and PROVINCETOWN add much to the visitor's interest in this primitive corner of New England. Although bleak and inhospitable in winter, the summer climate is charming, invariably cool, equable, and with all the advantages of a marine atmosphere. A railroad terminating at Provincetown affords access to the remotest point of the cape, and steamers from New Bedford touch at WOOD'S HOLL, COTTAGE CITY, on MARTHA'S VINEYARD, and NANTUCKET. There are no elevations beyond 300 feet, and the breezes from the Atlantic on the east, Nantucket Sound on the south, Buzzard's Bay on the west, and Massachusetts Bay on the north render the climate insular. The prevailing winds are from the south and southwest. The Gulf Stream tempers the southerly and southeasterly winds, and the waters are much better adapted for bathing than those of the shore north of Boston or further to the eastward. Fogs are not unusual in summer, especially in the neighborhood of the Vineyard Sound, but navigation is protected by the numerous lighthouses, lightships, bell-buoys,

and so forth. The United States Fish Commission maintains a station at Wood's Holl, and scientific bodies have instituted here well-equipped marine laboratories where students can study the flora and fauna of the sea. The region can be strongly recommended as a resort for the **mentally fatigued**, the **overworked**, the **melancholic**, and the **convalescent**. Its fascination for all who have read of these ancient haunts of the Indian races, or who delight in the natural features of ocean and shore, can be understood only by personal experience. There are numerous well-kept but primitive houses for summer visitors, and from Buzzard's Bay Station to Wood's Holl there are many private estates that manifest evidences of wealth and comfort.

BLOCK ISLAND (latitude $41^{\circ} 13'$ north), fifteen miles from the Rhode Island coast, is one of the stations of the United States Weather Bureau. It has a mean annual temperature of 50° F., and a mean rainfall of 53 inches. High winds often prevail. The island is only seven miles long by three miles wide, but its hills and valleys and its equability of climate make it attractive to the summer visitor. Its climate is essentially marine.

NANTUCKET ISLAND (latitude $41^{\circ} 23'$ north), a popular summer resort, has an interesting history. It was formerly a whaling center. The air is cool and has very little diurnal variation. The inhabitants are long lived, hardy, and hospitable. There are numerous cottages at SCIASCONSET, a few miles from the village of NANTUCKET. The climate resembles that of Block Island. The average temperature in July is 76° F. at Nantucket village, and 71° F. at 'Sconset,' about nine degrees less than at New York.

MARTHA'S VINEYARD, a large island near the southern coast of Massachusetts, is a favorite summer resort. COTTAGE CITY contains numerous inexpensive cottages, and a well-attended 'camp meeting' is held there during the summer. The climate is equable—neither cold nor hot. There is about 84 per cent. of relative humidity, and steady breezes come in from the ocean. The large percentage of sunshine, the pure air, and the ample facilities for sea-bathing, fishing, and sailing make it a desirable place for recreation and the relief of **chronic diseases** not tuberculous. The following table of temperatures well exhibits the characteristics of these resorts :

TEMPERATURE, IN DEGREES FAHRENHEIT, FOR 1899.

	NANTUCKET.	BLOCK ISLAND.	VINEYARD HAVEN.
Maximum :			
June,	78	83	86
July,	80	80	85
August,	82	80	84
September,	77	79	81
Minimum :			
June,	63	65	68
July,	55	52	59
August,	57	49	51
September,	49	48	47
Maximum daily range :			
June,	24	26	29
July,	18	22	22
August,	18	22	25
September,	19	16	24
Minimum daily range :			
June,	8	9	11
July,	5	6	7
August,	18	22	25
September,	5	5	6
Average daily range :			
June,	11.9	13.8	17.3
July,	11.	11.9	15.2
August,	10.5	11.2	14.6
September,	10.8	10.4	14.

Nantucket has a diurnal range of temperature very nearly like that of Atlantic City and Cape May, and shares with those stations the most equable climate on the Atlantic coast. The prevailing winds at Nantucket, Vineyard Haven, and adjacent stations are westerly and southwesterly. Electric storms are rare. These islands are sandy, with high bluffs. The water-supply of Nantucket is from a large fresh-water pond, supplemented by wells. There is a sewer in the village of Nantucket emptying into the deep waters of the harbor channel. Cess-pools also are in use.¹

The climate of Nantucket, Vineyard Haven, and Block Island is suitable for the **very old** and the **very young**; for those suffering from **functional nervous affections**, neurasthenia, insomnia, and neu-

¹ Harold Williams, M.D., "Transactions of the American Climatological Association," 1901.

ralgia; for **convalescence** from diseases of the respiratory organs; for **chronic dysentery** and **diarrhea**, and especially for the **enterocolitis of children**. Many **hay-fever** subjects find immunity in this region. Nantucket has an excellent establishment for hot salt-water baths; there are good hotels and boarding-houses, and cottages can be hired for the season.

Rhode Island is an important maritime State. Hilly in the northern and western portions, and deeply indented by **Narragansett Bay** in the southeast, it affords a climate comparable to that of eastern and southern Massachusetts. It is more fully sheltered from easterly and northeasterly winds, and the waters of the bay are comparatively quiet. Whatever disadvantages may pertain to a winter residence near the sea in that latitude, the summers are cool and the atmospheric conditions as desirable as can be found on the New England coast. There is a difference between Narragansett Bay and Buzzard's Bay in this respect. The former is less subject to fog, which in June and early July is not unusual. There are variations between places on Narragansett Bay but slightly separated from one another; thus, Jamestown, on Canonicut Island, has a decided advantage over Newport, although only two miles distant.

NEWPORT (latitude $41^{\circ} 29'$ north) is of historic interest, overshadowed in the popular view by its modern repute as the most fashionable watering-place in America. It is not a health resort in the ordinary sense, but the sea air, the yachting, the driving, and the freedom from usual occupations restore many a man and woman to health provided there is not too much yielding to social attractions. There is apparently no limit to the expense of cottage life. Cottages rent for from \$1000 to \$20,000 a season. The city is well laid out, with broad avenues, and the beautiful estates are famous the world over. JAMESTOWN, on Canonicut Island, and NARRAGANSETT PIER lie opposite Newport, on Narragansett Bay. They are attractive summer resorts, less expensive than Newport, and Narragansett Pier offers all gradations of society and charges.

WATCH HILL, in the extreme southwestern corner of Rhode Island, and NEW LONDON and NIAHTIC, on the **Connecticut** shore, are favorite resorts. New London is famous for its harbor, its boat-races,

its good society, and the longevity of its inhabitants. It is situated on the west bank of the Thames and near its mouth, on soil that is well drained, mainly of loam, with minute gravel and little sand or clay. The mean annual temperature is 49.7° F. The average mean for July is 71.6° F.; the highest temperature, 89° F.; the mean humidity, 72 per cent. The average rainfall for eighteen years is forty-nine inches. The town has an excellent water-supply. There is easy communication with WESTERLY, WATCH HILL, FISHER'S ISLAND, and SHELTER ISLAND across the Sound. MYSTIC and STONINGTON, on the Sound, a few miles to the east, have some attractive features. At Mystic, in a beautiful park on the Mystic River, is conducted the Peace Union's summer nature school for children. NORWICH, on the Thames, a little more than ten miles to the north of New London, is a fine old town. Those who have never known its beauties by experience will find an entrancing description of it in Henry Ward Beecher's "Star Papers."

The city of NEW HAVEN, the seat of Yale University, is not a health resort, but may be mentioned as one of the most pleasant places of residence in the United States. It is situated in latitude $41^{\circ} 18'$ north, at the head of New Haven Harbor, four miles above its entrance into Long Island Sound. It stands upon a plain, inclosed landward by an amphitheater of hills. Two of these, East Rock and West Rock, rise in perpendicular precipices from 300 to 400 feet. The majestic elms that skirt its wide streets form a notable feature of this city.

Visitors can obtain satisfactory medical attendance at all prominent resorts on the New England coast from Bar Harbor to Narragansett.

INTERIOR RESORTS OF NEW ENGLAND

POLAND SPRINGS, a summer resort in South Poland, southwestern **Maine**, is noted for its water, which is remarkably pure and extensively used for **diabetes mellitus** and various forms of **renal disease**. The hotel is well kept and has an excellent patronage. The climate is cool and drier than that of the coast resorts.

The RANGELEY LAKES are in southwestern Maine, about 1900 feet above sea-level. They are visited in summer by sportsmen,

and furnish remarkably fine trout fishing. This region affords immunity from **hay-fever** and **malaria**. The Rangeley Mineral Spring yields a pure water similar to the Poland Springs. There are numerous ponds, on the shores of which are camps, with every facility for out-of-door life. The nights are cool, and the air is exhilarating and rarely very warm, even at midday.

In the interior and northern portions of Maine there are thousands of lakes and ponds connected by streams emptying into six rivers, the Penobscot and Kennebec running south, and the St. John, Allagash, Fish, and Aroostook running north. MOUNT KATAHDIN and MOUNT KINEO are among the famous mountains; the scenery is superb, and the opportunity for woodland life is unsurpassed. Many seek the Maine woods for **recreation**, for fishing and hunting, for freedom from **hay-fever**, and for the wonderful effect of the stimulating climate upon **exhausted bodies and brains**. The region is reached by the Bangor and Aroostook Railroad, and beyond that the canoe and the camp must mainly be relied upon. At Mount Kineo, on MOOSEHEAD LAKE, is a large and well-kept hotel. In 1898, 3377 deer and 202 moose were shipped by rail from this region.

The **White Mountain region** in **New Hampshire** is famous for its immunity from **hay-fever**. It is estimated that 50,000 visitors come to New Hampshire annually, spending over \$5,000,000 each season in 1400 summer hotels and boarding-houses. The favorite resorts are BETHLEHEM, MAPLEWOOD, CRAWFORDS, TWIN MOUNTAIN, JEFFERSON, and DIXVILLE NOTCH. BETHLEHEM may be taken as a type of the White Mountain resort. Situated at an elevation of 1459 feet,—higher than any other town or village in New England,—surrounded by, although not in close proximity to, the mountains, Bethlehem is a popular and desirable station. It is located on a plateau overlooking the Ammonoosuc valley, well protected on the east by a high hill and a mountain of moderate elevation—Mount Agassiz. To the west and south it is quite open, affording beautiful views of the distant mountains of Vermont and Maine. Observations taken at Bethlehem in August, 1898, showed a range of temperature from 55° to 82° F. The mean relative hu-

midity at 8 A.M. was 78 per cent.; at 2 P.M., 63 per cent.; at 8 P.M., 78 per cent. The rainfall was 7.13 inches.¹

There is likewise a large extent of mountainous region from Lancaster and Littleton on the west, to Bethel, Maine, on the east, and from Jackson and Crawford House on the south, as far as Canada on the north, in which there is more or less exemption from hay-fever.

The average elevation of this district is 1400 feet, and in summer it is quite as well suited to the needs of those suffering from bronchial and pulmonary disorders, general debility, and the like, as to hay-fever subjects.

There are 600 sheets of water in New Hampshire, some of them beautiful lakes of large extent. A few may be mentioned :

LAKE WINNIPISEOGEE is of irregular shape, about twenty-three miles long, and 472 feet above sea-level. It is east of the center of the State. SUNAPEE LAKE is ten miles long, from one-half to three miles wide, and has an elevation of 1104 feet. NEWFOUND LAKE is seven miles long and 597 feet above sea-level. OSSIPEE LAKE is eight miles long and about fifteen miles south of Conway. ASQUAM LAKE, situated northwest of Lake Winnipiseogee, at an elevation of 530 feet, is a beautiful lake with picturesque shores. There are sixty-five islands in the lake. MASCONIA LAKE, near Lebanon, PENACOOK LAKE, near Concord, and SILVER LAKE, near Keene, are all attractive resorts. The elevation of the last-named lake is 1306 feet. SPOFFORD LAKE, six miles long, near Keene, has an elevation of 700 feet. SILVER LAKE and CHOCORUA LAKE, near Conway, are healthful regions. GRANITE LAKE is a small sheet of water ten miles from Keene, and has an elevation of 1500 feet. WINNEPOCKET LAKE and WALKER'S POND, in the town of Conway, and LAKE PLEASANT, at an elevation of 800 feet, are grouped about Kearsarge Mountain, which rises to a height of 3200 feet. LITTLE SUNAPEE LAKE has an area of about one square mile, and is situated at an altitude of 1240 feet. ECHO LAKE, in the famous Franconia Notch, and PROFILE LAKE are situated in private estates.

¹ Personal observations of Dr. Hinsdale.

A portion of this region, embracing a part of Croydon Mountain, in Sullivan County, has been inclosed as a private park. In this inclosure of 21,000 acres there are deer, caribou, moose, buffaloes, and wild boars—in all about one hundred varieties of animals. It is an attempt to preserve, so far as may be in their natural surroundings, a few types of animals now rapidly becoming extinct.

The Green Mountain State, as **Vermont** is called, forms the north-western section of New England. Its climate is similar to that of New Hampshire, but it is more remote from the sea. **LAKE CHAMPLAIN** is on the west and the St. Lawrence valley on the north. The annual rainfall increases from 38 inches on the lake to 44 inches in the south. There is, however, great variation in the amount of rainfall in different years.

At **BURLINGTON**, on Lake Champlain, the summers are cool and agreeable, but in winter there are cold winds that sweep from the Adirondack Mountains across the lake, and no protection is afforded. **STOWE**, just above the center of the State, is better sheltered, and is also an agreeable summer station. Its elevation is 700 feet. There is a hotel on the summit of **MT. MANSFIELD**, at an elevation of 4400 feet.

Massachusetts contains a number of inland resorts possessing varied climatic qualities; some are principally useful as offering country life for the summer, in an interesting and healthful region. Others possess somewhat of the quality of health resorts.

RUTLAND, twelve miles from Worcester and fifty-four miles from Boston, is the seat of the **Massachusetts Hospital for Consumptives and Tubercular Patients**. This institution, opened in 1898, has the honor of being the first State sanatorium for consumptives in America. Its elevation above sea-level is 1200 feet, and it is protected by greater hills north and west. The grounds embrace 200 acres. Only patients in the incipient stage are received, and the weekly charge is \$4.00. During the year ending November 1, 1899, there were 214 patients admitted and 114 discharged, of whom 35 were designated as 'arrested' cases, 37 'much improved,' 17 'improved,' 24 not improved, and 1 died. The average stay in the

sanatorium of 'arrested' cases was four and one-half months. It has a capacity of 170 patients. This is a good report, considering the climate of Massachusetts.

Berkshire County, forming the western extremity of Massachusetts, and extending across the breadth of the State, perhaps offers the most attractive inland resorts. The surface is partly mountainous and partly hilly; there are numerous streams, five rivers, and extensive forests of beech, hickory, elm, oak, sugar maple, etc. Saddle Mountain (3505 feet), in the northern portion, is the highest point. The Berkshire Hills are noted for their scenic beauty and tonic climate. LENOX, STOCKBRIDGE, LEE, PITTSFIELD, and WILLIAMSTOWN, the last the seat of Williams College, are most attractive towns and have become gay and fashionable resorts. They are free from the harsh winds of the coast and from the malaria that pervades so many towns in the Connecticut valley. While perhaps not the preferable climate for phthisis, residence in this portion of the State might be desirable for **functional nervous disease, hay-fever, and for aiding convalescence.** The elevation at no point is too great for any case of **heart disease or hemorrhagic phthisis.** The climate is tonic and mildly exhilarating, especially in the late summer and early autumn months. The country affords the best opportunity in New England for driving, and in October displays the most brilliant foliage.

There are a number of towns and villages in western **Connecticut** that possess delightful summer climates and exceedingly healthful and attractive surroundings. They possess a decided advantage over other places in their accessibility from New York city, the low cost of living, and the freedom from conventionality and display.

Among such places may be mentioned **NEW CANAAN**, north of Stamford, **RIDGEFIELD**, **DANBURY**, **NEW MILFORD**, **LITCHFIELD**, **SALISBURY**, and **CANAAN**. The accommodations in these places consist of well-kept boarding-houses.

CHAPTER XVIII

**CERTAIN COAST RESORTS OF THE UNITED
STATES OF AMERICA—THE MIDDLE
ATLANTIC STATES**

*Resorts on Long Island, in New York Harbor, and on the Coast of
New Jersey, Delaware, and Virginia.*

LONG ISLAND

Long Island lies south of Connecticut, between 72° and 74° west longitude and 40° and 41° north latitude. At its western extremity lies a portion of the city of NEW YORK,—the boroughs of Brooklyn and Queens,—separated from Manhattan by the East River, and containing over 1,250,000 inhabitants. At the time of its consolidation with New York city BROOKLYN was the fourth city of the United States in population. It is connected with Manhattan by a bridge, over which a very large number of Brooklyn residents cross daily, to and from their occupations. Other bridges are under construction. At the eastern end of Long Island, 120 miles distant, is MONTAUK POINT, used in 1898 as a camp for United States troops, at the close of the Spanish-American war. Experience showed, however, that it was not well suited for that purpose.

North of Long Island is Long Island Sound, and on this shore are eight deep and extensive bays. On the east end, Great Peconic, Little Peconic, and Gardiner's Bays indent the coast. On the south shore there is a series of shallow bays protected from the ocean by low, outlying, narrow beaches. The largest of these, from west to east, are Jamaica, Hempstead, Great South, East, and Shinnecock Bays. Many resorts along the southern shore—for example, the Rockaways—thus afford both still water and ocean sports.

The average height of the hills of Long Island is 384 feet above tide. There are no important lakes or rivers, the largest of the former being Lake Ronkonkomo, three miles in circumference and about eighty feet deep. The eastern and southern shores are more

directly under the influence of the Gulf Stream. Captain J. E. Pillsbury, U. S. N., who has made a special study of the coast, has stated that notwithstanding the fact that cold or polar currents exist on the landward side of the stream, if the prevailing winds in New England in winter were southeast instead of northwest, the climate would be as mild and balmy as that of the Azores. Under favorable conditions of wind the current does deliver its heat in quantities sufficient to modify the climate considerably during brief periods. The eastern and southern shores of the island are the coolest in summer; the sea-breezes, springing up about the middle of the forenoon, blow usually at the rate of ten or fifteen miles an hour. This breeze reaches at least ten miles inland, and further if combined with the southwesterly winds of the coast. The northern border of the island is therefore more sheltered from the winds from the Atlantic Ocean.

Following is a comparison of mean temperatures Fahrenheit:

	MEAN JANUARY.	MEAN JULY.	MAX. JULY.	MIN. JULY.	RANGE. JULY.
Long Beach,		70	88	63	25
Cutchogue,	30.4	71.3	94	53	46
Setauket,	30.5	71.8	95	54	41
New York,	31	74.1	99	57	42
San Diego, California,	56.8	66.7	77	60	17

FROST.	FIRST KILLING FROST OF AUTUMN.		
	EARLIEST DATE.	LATEST DATE.	AVERAGE.
Easthampton, Eastern End, . .	September 28th	November 27th	October 20th
Flatbush, Western End, . . .	" 13th	October 26th	" 4th
Jamaica, Western End,	" 2d	" 28th	September 29th

Rainfall is well distributed through the year. Block Island, twenty miles due east of Montauk, has an annual rainfall of 44.79 inches; Easthampton, 37.50 inches; Setauket, 50.80 inches; New York, 45.14 inches. The amount of sunshine on the east end and south shore of Long Island is large. Cutchogue has one hundred more clear days than New York and one hundred and sixty-two more than Rochester, near Lake Ontario. The summer sunshine at the eastern end of Long Island rivals in amount that

of the Rocky Mountain region. The mean relative humidity of Long Beach is 60 per cent. in August and 54 per cent. in September, or from 16 to 18 points lower than in New York city.¹

The resorts on Long Island are quickly reached from New York city by rail and the nearer ones by water route and by trolley cars. Some are used principally as summer resorts, and others as places of permanent residence, though these also have a great influx of visitors in the summer. The most accessible resort is CONEY ISLAND, including Brighton Beach and Manhattan Beach. These are chiefly patronized for a few hours of holiday excursion in the afternoon and evening, and provide for thousands of visitors of a somewhat 'mixed' character, a varied entertainment. Next in order, on the south shore, are the ROCKAWAYS, LONG BEACH, BABYLON, ISLIP, PATCHOGUE, QUOGUE, the MORICHES, SHINNECOCK HILLS, SOUTH HAMPTON, and EAST HAMPTON. Along the sound are FLUSHING, LITTLE NECK, SEA CLIFF, GLEN COVE, OYSTER BAY, COLD SPRING HARBOR, SETAUKET, CUTCHOGUE, and SAG HARBOR. These resorts on the north shore of Long Island are not so favorably situated as those nearer the ocean, but certain islands, such as SHELTER ISLAND and GARDINER'S ISLAND at the eastern end, possess an agreeable and healthful climate that renders these places popular. WESTBURY, west of the center of the island, is the seat of some beautiful estates. PINE PARK, Brentwood, in the interior of the island, four miles from Great South Bay, and eleven miles from the ocean, is well adapted for a health resort in both winter and summer.

The chief attractions of all these resorts are the facilities they offer for bathing, boating, and fishing. The climate is especially suitable for the *neurasthenic* and for general relaxation from business cares. FIRE ISLAND, stretching between Great South Bay and the Atlantic Ocean, is excellent for sufferers from *hay-fever*. Its insular position and limited area insure a marine climate. The prevailing winds being southerly and southwesterly, there is almost no land-breeze.

¹ For these observations see article by Dr. Denslow, "Medical Record," June 1, 1901.

At the entrance of New York harbor, toward the western shore, lies STATEN ISLAND, connected by ferry with Manhattan. Under the name of Richmond it forms one of the boroughs of New York. It is somewhat rural, and resembles in general character the neighboring portion of New Jersey, from which it is separated by a small river, the Kill von Kull. The principal localities on Staten Island for residence are ST. GEORGE, RICHMOND, TOTTEVILLE, NEW DORP, and TOMPKINSVILLE. Excursions from New York are made to SOUTH BEACH.

THE NEW JERSEY COAST

The coast of New Jersey, taking it as a whole, occupies the most favorable position in the United States for sea-bathing resorts. It extends from latitude $40^{\circ} 40'$ north at Sandy Hook, to latitude 39° north at Cape May. Its resorts are too numerous to be described individually; going southward from New York, the more important may be enumerated in the following order:

SANDY HOOK, HIGHLAND BEACH, NAVESINK BEACH, ATLANTIC HIGHLANDS, SEA BRIGHT, LOW MOOR, MONMOUTH BEACH, LONG BRANCH, WEST END, ELBERON, DEAL BEACH, ASBURY PARK, OCEAN GROVE, AVON, BELMAR, COMO, SPRING LAKE, SEA GIRT, MANASQUAN, BRIELLE, POINT PLEASANT, BAY HEAD, MANTOLOKING and CHADWICK on SQUAN BEACH, LAVALETTE, ORTLEY, BERKELEY, SEASIDE PARK, ISLAND HEIGHTS, TOMS RIVER, BARNEGAT PARK and BARNEGAT PIER, BARNEGAT CITY BEACH, HARVEY'S CEDARS, LONG BEACH CITY, BEACH HAVEN, SEA HAVEN, TUCKERTON, EDGE COVE, BRIGANTINE, ABSECON, ATLANTIC CITY with its suburb, CHELSEA, SOUTH ATLANTIC CITY, LENNIG, LONGPORT, SOMER'S POINT, OCEAN CITY, SEA ISLE CITY, AVALON, ANGLESEA, WILDWOOD, HOLLY BEACH, SEWELL'S POINT, CAPE MAY and CAPE MAY POINT.

Climatically, they have much in common, though there are individual differences; they differ too, not only in regard to fashion, season, expense, mode of living, hotel and other accommodations, but also in regard to access. Oliver Wendell Holmes once said that New Jersey was not a State but a 'double-headed suburb,' the region north of Trenton belonging to New York, the region south of the capital belonging to Philadelphia. The same may be said of

the coast resorts ; south from Seaside Park or Barnegat they belong to Philadelphia and the southern States ; from Point Pleasant north, they belong to New York and the western States. As a matter of fact, every resort from Atlantic City southward must be reached by rail *via* Philadelphia or Camden, which lies on the Jersey shore of the Delaware River, opposite to Philadelphia ; north of Beach Haven they have direct railroad communication with New York. Some of them, as Long Branch, Asbury Park, Atlantic City, and Cape May, have comparatively large permanent populations and are open winter and summer ; though the bathing season, of course, extends only from about June 1st to the end of September. Others are merely summer resorts. Some, as those already mentioned and the large group on the strip of coast, about twenty-five miles long, between Long Branch and Point Pleasant, are well furnished with hotels and boarding-houses and numerous private cottages of all degrees of elegance and simplicity. Others, as Brielle, Mantoloking, Chadwick, and especially Barnegat Pier, Absecon, Somer's Point, and Avalon, are principally resorts for fishing and boating, and the accommodations are more or less primitive.

LONG BRANCH, with its suburbs, WEST END, HOLLYWOOD, and ELBERON, is one of the largest, wealthiest, and most beautiful of the New Jersey seaside resorts. It has the best drives and contains the finest hotels and most imposing residences. Not the least of its attractions was the Monmouth race track, which has done much to relieve the monotony of ordinary seaside life. The beach is quite different from that found at the southern end of the coast. The sand bluffs are from ten to thirty feet above the sea, and the bottom has a more abrupt declivity toward the ocean. The shore is more stony and gravelly than at more southerly points. Forty years ago Long Branch was the most fashionable place on the Atlantic coast, but the tide has set northward, and Newport and Bar Harbor now reign in its stead. A stay at Long Branch may be restful, or fatiguing with gayety, as one wishes.

BEACH HAVEN is visited chiefly by those who enjoy quiet life. There are ample opportunities to enjoy salt air and salt water, and probably no place on the New Jersey coast is so free from objectionable characters. There is no upland herbage whatever, a desid-

eratum that renders Beach Haven and Tuckerton excellent resorts for hay-fever patients.

ATLANTIC CITY is situated in latitude $39^{\circ} 21'$ north, sixty miles southeast of Philadelphia, upon a narrow island barely separated from the mainland by inlets from the ocean. Its soil is dry and porous. The air is comparatively dry, owing to the vast areas of pine forests and sandy regions that stretch for fifty miles behind it. The land-breeze in summer is hot, but the sea-breeze that rises as the day advances affords instant relief, and its influence is felt far into the interior of the State. The proximity of the Gulf Stream tempers the winter climate and affords agreeable sea-bathing all through the summer. The rainfall varies from 38 to 54 inches annually, and the temperature has fallen on rare occasions below zero (F.) and has risen once to 97° F.; as a rule, however, the air is much cooler in summer and warmer in winter than that of Philadelphia. Fogs are exceedingly rare. There is no malaria.

Atlantic City is a well-ordered city, with an excellent system of water-supply, modern sewerage, and a strict enforcement of advanced sanitary regulations, its character as a health resort being guarded by an intelligent city government. Although practically open all the year, its chief seasons are from June to October as a general summer resort and bathing place, and again from February to May. It is during the winter and early spring that it is to be considered as a climatic health resort. In summer its 800 hotels and boarding-houses are crowded with guests. Its railroad facilities are ample, the run from Philadelphia occupying only seventy minutes, and from 25,000 to 30,000 persons are often carried to Atlantic City in a single day. The hotels are well kept, and its famous boardwalk, four miles long, where rolling chairs may be hired for the weak, its casino, and the ocean piers, a thousand feet long, afford varied means of entertainment for adults and children.

The rapid growth of Atlantic City is based upon its well-earned reputation as distinctly a health resort. In summer, however, its character as a pleasure resort preponderates, and it is thronged by rich and poor alike. The southern end of Atlantic City, now designated as CHELSEA, offers some relief to those who wish to avoid the greater crowds, and the cottages of this portion of the island are

more desirable for summer residence on that account. Good yacht and golf clubs add to the attractions.

Atlantic City is a good place to recover from the **fatigue** attendant on city life in all its phases; **insomnia**; **loss of appetite and flesh**; **coughs**; the **sequelæ** of **grip** and **pneumonia**; the **effects of alcohol** and of the **irregular eating** common among American business men. It is a suitable **winter residence** for **aged persons**; for the subjects of **chronic Bright's disease**; for patients with early or quiescent **pulmonary tuberculosis** or with **fibroid phthisis**. **Convalescents from acute disease** will find here, as a rule, a welcome change and a rapid recovery.

CAPE MAY, in latitude $38^{\circ} 56'$ north, is the oldest resort on the New Jersey coast, and owing to its position between bay and ocean possesses a nearly insular climate. It occupies the extremity of a peninsula, the ocean lying to the east and south, while the broad Delaware Bay stretches to the west and northwest. Thus nearly every breeze is from the water, and at the 'Point' a land-breeze is a rarity. Cape May city is built on an island three miles east of the Point. The underlying soil is gravel, with sand under the gravel-beds, and the surface-wells, upon which the city depends, have an excellent supply of pure water. It possesses a distinctly marine, equable climate, and one of considerable humidity. The relative humidity ranges from 70 per cent. in November to 80 per cent. in July, the average for the year being 76.4 per cent. The mean annual temperature is 54.4° F., or 2.5° higher than that of Atlantic City. The mean daily range is 8° F. While temperatures as high as 88° may occur in summer, the air is quickly cooled, as a late afternoon breeze from the ocean sweeps landward. The nights are usually cool and afford relief from the accumulated heat of the cities. In 1898 there were twenty-two more clear days at Cape May than at Atlantic City, but about two inches more rainfall, the excess occurring in the summer. The average mean annual rainfall at Cape May is 33.12 inches. There are excellent hotels and many cottages that may be rented. It is reached in from one and three-quarters to two hours by rail from Philadelphia. The Seaside Home for Children is open during the summer months and offers accommodations for children and a limited number of adults at

nominal cost. It is situated at Cape May Point, three miles from Cape May.

Cape May beach is unexcelled on the coast ; it is broad and hard, and its descent below the water-line is very gradual. The beach is, as a rule, a safe one for bathing, and in midsummer the beach at the bathing hour presents a most animated sight. There are times when continued easterly or northeasterly winds roll up heavy seas ; only the most robust can enjoy the breakers at such times.

Cape May is chiefly indicated as a resort for sufferers from **insomnia** and **neurasthenia**, and for those who are **convalescing** from acute **respiratory affections**. Children always do well, and it is a good place for those in **advanced life** who desire to obtain the sedative effect of sea air. It can not be recommended in tuberculous affections of the lungs, but the climate is not necessarily a disadvantage in chronic tuberculous disease of the bones.¹

Throughout New Jersey great advances have been made in coping with preventable diseases. The activity of the State Board of Health is a safeguard not only to the citizens of the State, but to the many thousands who visit the coast for health or pleasure, winter and summer.

DELAWARE

The coast of Delaware resembles that of lower New Jersey. It is of small extent, and while naturally favorable for summer residence, is not so well provided with railroad communication as it deserves and no doubt will some day enjoy. The principal point on the coast is LEWES, a few miles below Cape Henlopen, which guards the entrance to Delaware Bay. Six miles to the southeast of Lewes is REHOBOTH BEACH. The country back of the coast is low, flat, and sandy, and in summer very hot. It is under general cultivation, and is famous for its peach orchards. There are numerous points on the west shore of Delaware Bay, which has a width of twenty or thirty miles, where summer resorts will no doubt spring up in the future.

¹ See article by Dr. Hinsdale in "Buck's Reference Handbook of the Medical Sciences."

OCEAN CITY, on the **Maryland coast**, is only a few miles below Lewes. It is inexpensive, and is popular as a sea-bathing resort and easily accessible from Baltimore by rail.

THE VIRGINIA COAST

OLD POINT COMFORT (latitude 37° north), one of the oldest sea-coast resorts in the United States, is popular at all seasons, easily accessible by rail or steamer from Washington and Richmond, and a short trip by water from Norfolk. It has two large hotels, the Chamberlin and the Hygeia, which are well appointed and in the early spring are crowded with visitors from all portions of the United States. Situated near the mouth of Chesapeake Bay, near Hampton Roads, the waters are warm; bathers usually find the surf less heavy than on the ocean shore. The temperature is mild in winter and not likely to be very high in summer. There is much to interest the visitor at Fortress Monroe and Hampton, and the sailing and fishing are excellent. Old Point Comfort has proved helpful to **convalescents from acute disease**.

VIRGINIA BEACH, fifteen miles from Norfolk, is easily reached by rail. The Princess Anne Hotel is well appointed, and has several thousand acres of pine forest that extend for miles along the coast. The surf bathing is excellent, and owing to the proximity of the Gulf Stream, bathing may be indulged in much earlier than at points further north. There is excellent shooting, and there are fine opportunities for horseback exercise. The combined advantages of good living, pure air, sea-bathing, a dry soil, and adjacent pine forests render Virginia Beach a desirable health resort. It is a good half-way station between the north and the extreme south, and is adapted for cases of **chronic nephritis, bronchitis, overwork, and neurasthenia**.

CHAPTER XIX

CERTAIN INLAND RESORTS OF THE UNITED STATES OF AMERICA—THE STATE OF NEW YORK

The Adirondack Region. The Catskill Mountains. The Hudson River Region. Other Resorts in New York.

New York is unexcelled in the abundance of its health and pleasure resorts. Many of them are used only for summer residence or visited only for a holiday outing. The Hudson River, the most beautiful river on the American continent, rises west of Lake Champlain; opposite Newburg it has a width of about three miles, becoming very narrow at West Point, widening again opposite Tarrytown to five miles. Malaria was formerly common all along the valley of the Hudson, but has not been so in recent years. In describing the resorts of New York we shall begin with the Adirondack region, including the Thousand Islands at its western approach and Saratoga on its southeastern border, passing thence to the Catskill Mountains, the Hudson River region, and, finally, to some of the spas and resorts in the interior of the State.

THE THOUSAND ISLANDS

The THOUSAND ISLANDS lie in the St. Lawrence River, between New York and Canada, near the outlet of Lake Ontario. This remarkable group of islands numbers over 1600, and extends down the river for forty miles. They afford delightful sites for cottages and camps, and are well provided with hotels. Some of them are several miles in length. The principal islands are ROUND ISLAND and WELLESLEY ISLAND, directly opposite Alexandria Bay. ALEXANDRIA BAY, the lakes of THERESA, CLAYTON, and CAPE VINCENT, near Lake Ontario, are excellent for fishing and abound in camps and cottages. The air is cool and stimulating, and the entire

region is useful for the relief of hay-fever and insomnia. The annual mean temperature at OGDENSBURG, fifty miles down the St. Lawrence, is 45.2° F., and during June, July, August, and September the means in 1899 were 65.8° , 68° , 70.7° , and 58.2° F. The extremes were 20° F. and 93° F. The amount of rainfall is not large.

THE ADIRONDACK REGION

The ADIRONDACK MOUNTAINS are a spur of the Alleghanies, and form a distinct group in northeastern New York, between 43.5° and 44.5° north latitude. They are embraced in a circle having a diameter of about 100 miles, and may be estimated as covering an area of about 10,000 square miles. This whole region is well wooded with coniferæ, well watered, and abounds in lakes connected by small streams. There are plateaus ranging in altitude from 1200 to 1800 feet, with peaks rising over 5000 feet above sea-level. There are 350 hotels and smaller houses for the accommodation of guests, and innumerable camps and cottages, occupied in summer. These camps are of a permanent character.

Camp life in the Adirondacks has many advantages, especially for those who have abundant means. The cost of transportation is lower since the building of the Adirondack division of the New York Central Railway, which has made the region west of the Saranac Lakes much more accessible. The advantages of this region are its elevation, agreeable summer temperature, pure forest air, the sparsity of population, and the presence of immense tracts of sandy soil covered with evergreen forests, together with its rapid drainage and excellent water-supply. The climate is cold, and the winters are long. The mean annual temperature at Saranac is 42° F., and the total rainfall from 35 to 40 inches. Owing to the proximity of the St. Lawrence Valley, a favorite track of storms, cloudy weather is common. The general impression that the air in the Adirondacks is particularly dry is likely to disappoint one who expects to find a climate similar to that of the Rocky Mountains, but it should be remembered that the moisture that comes from above is far less objectionable than that which pertains to the soil. The relative humidity is about 73 per cent. in summer, or about 10 per cent. higher than from December to March, owing to the heavy frost and

the general covering of ice and snow. From seven to ten feet of snow fall annually.

The **principal resorts** are about the SARANAC LAKES, PAUL SMITH'S, LOON LAKE, LAKE PLACID, KEENE VALLEY and KEENE HEIGHTS, and ELIZABETHTOWN. In the north are CHAZY and CHATEAUGAY. In the western portion lie the TUPPER LAKES, the FULTON CHAIN of lakes, RAQUETTE LAKE, LONG LAKE, and BLUE MOUNTAIN LAKE. LAKE GEORGE may also be included as lying fairly in the southeastern border of the Adirondack region. For camp life Lake George offers excellent opportunities. Between CALDWELL and BOLTON there are numerous sites of hotels and camps, all reached by steamer. The mountains rise from all sides, and the lake itself is one of the most beautiful in America. Its climate during the summer months is characterized by a rather wide diurnal range of temperature, frequent showers, and a dry and pure atmosphere. GREEN ISLAND is provided with an excellent hotel, delightfully situated, and probably the best in the region.

SARANAC LAKE is situated in the heart of the Adirondacks, sixty-four miles southeast of Ogdensburg. The soil is sandy, and the mountains are well covered with spruce, balsam, and small groves of pine. For four or five months in the year it is very dry and cold. The mean annual temperature is 42.5° F., the annual range being 123° F. There are 132 clear days, 104 partly cloudy, and 129 cloudy. There are several good hotels, one of which is open only during the summer, and does not receive consumptives. There are golf-links, the mountain drives and walks are beautiful, the boating and fishing are excellent, and deer are hunted in the neighboring mountains. Camp life here is enjoyable and invigorating.

The **Adirondack Cottage Sanatorium** (1750 feet) is one and one-half miles from the village, and occupies a sheltered position on the hillside. Only patients in the **incipient stages of tuberculosis** are received, or when the disease may, in the opinion of the examining physician, be arrested. There are accommodations for almost 100 patients. There are twenty-six cottages, each one holding from two to six persons. The charge is \$5 a week; those able to pay more are not received. It is open throughout the year. Patients feel better during the winter months.

Saranac is reached in ten hours from New York by the New York Central and Hudson River Railroad, Adirondack Division, and from the north by the Chateaugay Railroad from Plattsburg.

RAY BROOK, three miles southeast of Saranac village, has been selected as the site for the **New York State Hospital** for the treatment of **incipient tuberculosis**. The site covers 525 acres, and it is intended that the hospital shall accommodate 200 patients. Another institution, projected by private philanthropy for the benefit of workingwomen, young married women, and children, is to be located at LAKE KUSHAQUA.

THE UPPER SARANAC LAKE (1573 feet) is nine miles long by two miles wide, with hotels and cottages well situated on dry soil, in full view of the highest peaks of the Adirondacks—Marcy, Whiteface, McIntire, Haystack, Colden, and Seward.

PAUL SMITH'S, in Franklin County, contains one first-class hotel and numerous cottages and camps. The lakes, including Upper St. Regis, Spitfire, and Lower St. Regis (1623 feet), are favorite sites for camps, and are in the direct line of communication by means of canoes with the Upper Saranac Lake.

At GABRIEL'S POST-OFFICE, near Paul Smith's, at an elevation of about 2000 feet, is situated the **Sanatorium Gabriels**, a cottage sanatorium for patients in the first stage of **pulmonary diseases**, or those convalescing therefrom. It is conducted by Roman Catholic nuns, and medical attendance is free. There are accommodations for seventy patients.

LAKE PLACID, ten miles east of Saranac, is about five miles long, and has an altitude of 1863 feet. This popular resort is well adapted for **summer residence**. There are seven hotels and numerous cottages and camps. There is direct railroad connection with Saranac. The scenery is unsurpassed in the Adirondacks. The soil is very porous, and the frequent showers in summer leave the ground comparatively dry. High winds and fogs are exceptional. The average temperature ¹ during August is as follows: At 9 A.M., 62° F.; at 3 P.M., 66.7° to 69° F.; at 7 P.M., 60° F. In August it is dryer than in July. There are, on an average, twenty-one clear

¹ Personal observation of Dr. Hinsdale.

days. In low places in the neighborhood of Lake Placid frost has occurred on the 12th and 13th of August. Observations at the Ampersand at Saranac gave a monthly mean temperature in September of 56° F.; October, 38° F.; November, 35° F.; December, 29° F. The mean relative humidity for these four months was 75 per cent., 73 per cent., 72 per cent., and 66 per cent. The maximum average for October, 48 per cent.; November, 42 per cent.; December, 38 per cent. The minimum averages for the same months were 29, 29, and 19 per cent.¹ Notwithstanding these low temperatures, the experience of Dr. Trudeau at Saranac is that tuberculous patients improve more rapidly during the colder, than during the warmer months.

The Adirondack Lodge, on CLEAR LAKE, on the northern slope of Mt. Marcy, affords an ideal mountain retreat. It has an elevation of 2160 feet, and is surrounded by dense forest. The Indian Pass and Avalanche Pass are also accessible on foot from this point.

KEENE VALLEY, twenty-two miles from Westport, a station on the Delaware and Hudson Railroad, is one of the driest and most picturesque places in the Adirondacks. The Ausable Lakes, at an elevation of 1360 feet, are six miles from the Keene Flats and three miles from Keene Heights. There are numerous cottages.

ELIZABETHTOWN is eight miles from Westport on Lake Champlain, and is delightfully situated at one of the entrances to the Keene valley and Marcy district. The elevation, about 800 feet, makes it a favorite resting-place for those who cannot ascend to the higher altitudes. The surrounding mountains and the beautiful Boquet River are picturesque features of Elizabethtown.

SARATOGA (latitude 43° north) is the most famous mineral water health resort in America. Its waters have been used medicinally for over a century. The chief springs are the Congress, Hathorn, High Rock, Saratoga Vichy, Geyser, Champion, Kissingen, and Seltzer. They vary largely in constituents, and should be used with discrimination. They are principally saline and chalybeate, and under medical supervision a large number of affections may be

¹ From personal observations by Dr. Hinsdale.

treated successfully by them. They are useful in the treatment of **dyspepsia, engorgement of the liver, and chronic constipation.** The climate of Saratoga is stimulant and tonic. It is dry in summer, and is likely to be dusty; high winds and fogs are infrequent. During the season, from June to early September, it is a fashionable, well-equipped resort, but there are also ample accommodations for persons of moderate means. Saratoga offers accommodation for 20,000 visitors at one time. There is a lake four miles distant. Saratoga boasts of a famous race-track, and there are opportunities for kindred sports. It may be visited by quiet folk in the autumn after the crowds have departed. The climate is mild until November, the foliage is brilliant, and there is much to enjoy.

The disadvantage of Saratoga from a therapeutic standpoint is that there is no organized system of control applying to persons seeking the benefit of the waters. One may drink as much as he likes of any spring, and very many who go there for the waters use them in a desultory manner, without medical supervision. The liberal diet of the hotels, the temptations to excess in food and drink, and the tendency to keep late hours, which are characteristic of life at the fashionable American resorts, combine to render a cure almost impossible. The mineral waters of Saratoga are principally used at home, being bottled and shipped to all parts of the United States. The names Congress, Hathorn, Vichy, and High Rock have become household words. Persons going to Saratoga should put themselves under local medical advice, and if the larger hotels are objectionable, accommodation may be secured at the smaller houses or at a well-known **sanatorium** where treatment may be had.

THE CATSKILL MOUNTAINS

This detached spur of the Appalachian Range occupies a position in southeastern New York, near the west bank of the Hudson River, just above the forty-second degree of north latitude. Its interesting regions have been made classic by Washington Irving. The mountains are from 1000 to 2500 feet in height, affording extensive and peculiarly beautiful views. They are chiefly used as a summer resort, and are reached by rail in about four and one-half hours from New York city, or by river boats from New York to Rondout

and Catskill Landing. The temperature is about ten degrees lower than in New York city. The nights are always cool, even in mid-summer. For persons of moderate means the Catskills offer a great deal at slight cost.

The air of the Catskills, while dry and pure, is not generally believed to be of quite the same quality as that found in the Adirondack Mountains. There is no special provision for invalids. Nevertheless, in cases where it is undesirable for persons with pulmonary affections to go so far as the Adirondacks, much can be accomplished among the Catskills.

TANNERSVILLE (2000 feet) has a sheltered position on the western slope of the Catskills. Efforts have been made here to provide accommodations for invalids. The air is dry, and colder in summer and warmer in winter, as a rule, than in the towns along the Hudson River.

Other stations in the Catskills are the KAATERSKILL, the CATSKILL MOUNTAIN HOUSE, HUNTER, CAIRO, PINE HILL, and BIG INDIAN. PALENVILLE is also an attractive station at a moderate elevation, ten miles from Catskill Landing.

THE HUDSON RIVER REGION

The Hudson River region is largely used for summer residence by people from New York and Brooklyn, and is readily accessible by rail and boat. From New York northward the principal stations are YONKERS, HASTINGS, DOBBS FERRY, TARRYTOWN, PEEKSKILL, WEST POINT, COLD SPRING, GARRISON, CORNWALL, NEWBURG, FISHKILL, NEW HAMBURG, MARLBOROUGH, MILTON, HIGHLAND, POUGHKEEPSIE, WEST PARK, HYDE PARK, HUDSON, and KINGSTON.

WEST POINT is famous as the site of the **United States Military Academy**. It is located in the Highlands of the Hudson, fifty-two miles north of New York city. The climate is cold in winter and likely to be very hot in summer.

HIGHLANDS OF SOUTHERN NEW YORK

LIBERTY, in Sullivan County, is 117 miles from New York, and is pleasantly situated at an elevation of 2300 feet on the summit of

a portion of the **Shawangunk Mountains**, a small, detached spur of the Alleghany system. Near Liberty is the dividing-line between the water-sheds of the Hudson and Delaware Rivers. There are no large bodies of water in the neighborhood, drainage is rapid, and the air has a dryness not found in the lake region or on the sea-board. The soil in the lower levels is a loam with a moderate amount of clay, but on the hillsides it is much more porous. The range of temperature is great, and the transition from winter to summer is rapid. Snow falls in November and remains dry and hard until summer is near at hand.

The neighboring towns of **LIBERTY FALLS**, **FALLSBURG**, **WOODBURNE**, **NEVERSINK**, **MONTICELLO**, and **HURLEYVILLE**, although not quite so high as Liberty, share in great measure its natural advantages as a resort for patients suffering from **pulmonary tuberculosis** and other affections of the lungs. The **Loomis Sanitarium for Consumptives** is located on Liberty Heights, two miles west of Liberty. The sanatorium is built on the cottage plan, with nineteen buildings, and accommodates 125 patients. The institution is for incipient cases. Patients are received in private rooms at from \$15 to \$30 a week, or in the charitable annex at \$5 a week. The institution is in charge of Dr. J. Edward Stubbett, with three assistants and a large corps of nurses. The exposure of the sanatorium to the south, southeast, and southwest makes out-of-door life possible in all seasons. The results thus far reported are encouraging. A private **sanatorium** for diseases of the throat and lungs, including tuberculosis, has recently been established in the vicinity, under reputable medical direction.

At **DANSVILLE**, forty-four miles south of Rochester, is located the **Jackson Sanatorium**, a well-equipped institution for the treatment of **chronic diseases**. Hydrotherapy, electricity, massage, and the Schott system of Nauheim baths are employed.

CHAUTAUQUA LAKE (1400 feet), situated in western New York, near Lake Erie and the Pennsylvania State-line, has an invigorating climate. A summer school is conducted here that draws thousands of visitors and has exerted a wide influence. Living is inexpensive, and the surroundings are attractive.

RESORTS OF CENTRAL NEW YORK

RICHFIELD SPRINGS, situated on Lake Canadarago, sixty-five miles west by north of Albany, and 1800 feet above sea-level, is a resort popular since the early part of the last century by reason of the great natural beauty of its surroundings and the therapeutic virtues of its sulphur waters. It has excellent hotels, and the bath-house in connection with the springs is thoroughly equipped, containing sixty-seven rooms for sulphur baths, besides Russian and Turkish baths; inhalation rooms for the treatment of **bronchitis** and **catarrh**; electric rooms, douche rooms, and a sun-bath. The waters are heavily charged with sulphureted hydrogen, and contain 112 grains of calcic sulphate in a gallon. There are also iron and magnesia springs. The waters are useful in **insomnia from nervousness**, or from **overwork**, in **stomach disorders**, and especially in cases of **rheumatism** and **gout**.¹ In the treatment of gout immersion or tub-baths at temperatures of from 98° to 102° F. are given for from eight to twelve minutes. The internal use of the water is also of great value. Massage, hot-air treatment, and static electricity are also available at Richfield Springs.

SHARON SPRINGS, in the central portion of eastern New York, is situated in a valley 1200 feet above the sea. The springs are known as the White Sulphur, the Gardner Magnesia, and the 'Eye-water' spring. They are used internally and externally, and have been employed for almost one hundred years. Commodious and well-equipped bath-houses have recently been erected.

CLIFTON SPRINGS, in Ontario County, 617 feet above sea-level, is situated midway between Geneva and Canandaigua. The waters contain sulphur and carbonic acid gas and resemble the Sweet Briar White Sulphur Springs of West Virginia. They are five in number, and contain moderate quantities of sodium, magnesium, and calcium sulphate. There is a **sanatorium** of good repute, with a staff of eight physicians and accommodations for 450 persons. It is open throughout the year.

Between Lake George and Niagara Falls, at the western end

¹ See articles by C. C. Ransom, M.D., "Transactions of the American Climatological Association," vol. VIII, 1891, p. 154, and vol. XVII, 1901.

of the State, there are numerous resorts. Among these are LAKE SKANEATELES, COOPERSTOWN, CAYUGA LAKE, ONEIDA LAKE, OTSEGO LAKE, and CANANDAIGUA LAKE. NIAGARA FALLS itself, while not especially noted as a health resort, is world-famous and has the greatest interest for the traveler. The climate is cool up to the early part of June, after which the days are liable to be very hot. There are accommodations throughout the year.

CHAPTER XX

THE RESORTS OF THE UNITED STATES OF AMERICA—INLAND STATIONS IN THE MIDDLE STATES (Continued)

New Jersey. Pennsylvania. Maryland. The District of Columbia.

NEW JERSEY

The State of New Jersey has an area of over 8000 square miles and a population of nearly 1,500,000. The entire southern half of New Jersey is flat and sandy, and contains vast tracts of pine forest. The trees, however, are principally a variety of small, hard, yellow pine known as 'scrub.' In the northern and northwestern parts of New Jersey the surface is more diversified and even mountainous, reaching elevations of almost 1800 feet, and the hillsides abound in hemlock and spruce. As yet, few visit the hills in the northern and northwestern portions, but these undeveloped districts, if more accessible to the larger cities, would no doubt be highly prized and largely sought. The soil in the northern half of New Jersey is largely a red clay, with outcroppings of sandstone and, in the northeastern portions, trap rock. In Essex County there are positive evidences of a great prehistoric lake called Lake Passaic. Its southern portion is the present site of a great swamp.

The sandy pine belt extends for sixty miles southwest from Freehold, in Monmouth County, in a strip from ten to twenty miles in width. LAKEWOOD and BROWN'S MILLS lie on the eastern border of this belt. The towns of ATCO, WINSLOW, HAMMONTON, MALAGA, and VINELAND are near its southwestern extremity. Geologically, it belongs to the posttertiary formation. The soil varies from a light sandy loam to pure sand, so that after rain it quickly dries. For the most part the region is well drained, free from mud, abounding in pines and exceedingly healthful.

VINELAND (118 feet) is a healthful, attractive, and prosperous

town of 4300 inhabitants. The winter climate is much milder than in places of the same latitude in Maryland. The mean annual temperature is 55.3° F.; the recorded extremes of temperature, 98° F. and 1° F. The annual rainfall is from 49 to 53 inches. The relative humidity ranges from 70 per cent. in December, March, and April, to 82 and 84 per cent. in July and August. The mean humidity is 75 per cent., about seven points higher than that of Philadelphia, and from six to nine points lower than that of Atlantic City or Cape May. Both Vineland and Hammonton offer, especially to persons in moderate circumstances, exceptional opportunities as places of residence for the tuberculous and for those subject to catarrhal inflammations of the air-passages, or who need protection from the cold, wet winters of neighboring States. The climate and the soil are not only favorable for out-of-door life both in winter and summer, and permanent recovery in all classes of cases except those needing altitude, or far-advanced in phthisis, but there are opportunities for self-support under very moderate expense, a combination not easily found in other localities. Hammonton is in many respects admirably situated for a sanatorium, and one has recently been established there. This whole region deserves much greater attention from the physicians of New England and the Middle States than it has yet received.

LAKEWOOD, situated in a sandy, pine-covered belt ten miles from the ocean and about sixty miles by rail from New York, has an elevation of from forty to sixty feet above tide. Although somewhat under marine influences, its climate partakes of the general character of the tract just described. It is free from raw winds, and under the influence and protection of extensive pine forests the air and soil are comparatively dry and well suited for invalids during the winter and spring. The sand reaches a depth of from 600 to 700 feet. There is no dust or mud, and the roads are well adapted for driving and cycling. Lakewood was originally considered a health station, but during recent years it has become a fashionable resort in autumn, winter, and spring for persons of wealth who enjoy out-of-door life, golf, riding to hounds, polo, and other sports. The hotels are large, modern structures and cater to the needs of those who come for rest and pleasure. There are,

however, a number of good boarding-houses where invalids can be accommodated, and a well-conducted hydrotherapeutic establishment.

Stretching in a curved line west from Newark through Essex County, the ORANGES (Orange, East, West, and South Orange), and a little further north, MONTCLAIR, offer the attractions of a healthful inland climate. Skirting them on the west, the Orange Mountains, visible from New York on a clear day, afford a charming view of the surrounding country. Llewellyn Park, in West Orange, is divided into handsome private estates. SUMMIT (in Union County) lies in the Orange Mountain range, and MORRISTOWN, further west (in Morris County), is situated on hills rising some 500 feet. Through this district macadamized roads stretch for many miles in every direction, making the region attractive for bicycling and driving. For summer resorts it is otherwise desirable only by reason of its quiet and its proximity to New York. Morristown, with its hills, its shelter, and its comparatively dry and equable climate, is a good place for winter residence for those subject to **catarrhal affections** of the respiratory passages, and for cases of **incipient tuberculosis** in those who cannot go far from New York. The region has historic interest. Eighteen miles to the west of Morristown, and fifty miles from New York, is SCHOOLEY'S MOUNTAIN (1200 feet), with alkaline earthy chalybeate springs. Schooley's Mountain was a favorite locality with the late Professor George B. Wood for the treatment of **phthisis**. Warren County, on whose southeastern border it lies, is traversed by several mountain ridges running on in one direction through Sussex and Passaic Counties into New York (Shawangunk and Highland ranges) and in the other direction crossing the Delaware River at Water Gap into Pennsylvania (Blue Ridge). These ridges rarely exceed 1800 feet in height, they are mostly well wooded and well watered, and between the two systems lies the fertile Kittatiny Valley. They contain many attractive places of summer resort, some with primitive accommodations, others with fairly kept hotels and boarding-houses. In this general region, including portions of the three States, Pennsylvania, New Jersey, and New York, the facilities for open-air life, camping, summer schools and the like, and for driving, cycling, and pedestrian tours, are fairly

good, especially if one does not get too far from the Delaware River. BUDD'S LAKE, CEDAR LAKE, and HACKETTSTOWN in New Jersey, PARADISE, COOLBAUGH, and DINGMAN'S FERRY in Pennsylvania, and PORT JERVIS in New York may be mentioned as places of call, departure, and sojourn on such excursions. LAKE HOPATCONG, on the border of Sussex and Morris Counties, New Jersey, lies amid wooded hills. There are good hotels and cottages on its shores for the accommodation of numerous visitors in the summer.

PENNSYLVANIA

Pennsylvania is, for the most part, a mountainous State, and is traversed from northeast to southwest by the Blue Ridge and Alleghany Mountains. The southeastern district is fertile, and about 10° F. warmer than in the highlands. Pennsylvania is separated from the ocean by the State of New Jersey. The climate is, therefore, the modified climate of the seaboard. The mean relative humidity in Philadelphia is 69 per cent.; in Pittsburg, 70 per cent.; in Erie, 73 per cent. The rainfall may vary from 22 inches to over 70 inches in different portions of the State and in different years. The extremes of temperature in Pennsylvania are greater than in New Jersey, but not so great as in New York and New England. The annual range is between 95° F. and 100° F.

In the northern and central portions of the State, in the mountainous district and high table-land, the winters are severe and long, and the snowfall is heavy; the summers are pleasant and more agreeable than in the southeastern portion, on the Delaware River, or westward on the banks of the Ohio.

DELAWARE WATER GAP is situated 600 feet above sea-level, in a narrow cleft where the river passes through a chasm in the Blue Ridge Mountains. The scenery is fine, and the air is dry, with little fog. It is likely to be quite hot in summer, owing to the sheltered position of the Gap. The highest hotel has an altitude of 900 feet, and at this point the average temperature is about 8° F. below that of Philadelphia. STROUDSBURG, six miles distant, is in a hilly, picturesque country, well known for its healthful qualities, and providing accommodations for persons of moderate means. It is a good

resort in the summer and early autumn. There is a small private sanatorium.

POCONO MOUNTAIN, in Monroe County, three hours by rail from New York and five hours from Philadelphia, affords elevations of from 1700 to 2000 feet. The mountain side is covered with a scant forest and a profusion of laurel and rhododendrons, while the vegetation in general gives off pollen specially obnoxious to most hay-fever sufferers. Large tracts of white and yellow pine, spruce, hemlock, and birch still remain; the soil is sandy, and the air is pure and dry. The average temperature in July at noon is 72° F., and in August, 69° F. The season lasts from June until October, and good accommodations may be had at WISCASSET, MOUNT POCONO, and SWIFTWATER. The hotel rates are not high, and the attractions include excellent trout fishing in May and June.

Between Stroudsburg and Pocono are several villages eligibly situated, with boarding-houses and inns offering fair and inexpensive accommodations to summer visitors. There are good drives and many pleasant walks on mountain side and in valley; the lakes, or rather large ponds, afford swimming and boating facilities. SPRAGUEVILLE, HENRYVILLE, CRESCO, SPRUCE CABIN, and MONROE CORNERS, in Monroe County, and BUSHKILL, in Pike County, may be mentioned. The Blue Ridge region of Pennsylvania is an excellent one for the sojourn of hardy patients with **pulmonary tuberculosis**, both in summer and winter. A sanatorium should be located here.

GLEN SUMMIT, Luzerne County, is situated at an altitude of 2000 feet. The air is particularly pure and dry, the soil porous and quickly drained, and the water-supply of a high degree of purity. There are 1.16 grains of solids in a gallon, and the water is extensively sold. The hotel is owned by the Lehigh Valley Railroad, and the sale of intoxicating beverages is forbidden on the plot of 550 acres on which the hotel and cottages stand. The climate is especially suitable for **tuberculous disease, chronic malaria, neurasthenia, insomnia, dyspepsia, and rheumatism**. Exemption from **hay-fever** is claimed, but is not found in every case.

WHITE HAVEN, in Luzerne County near Glen Summit, has been selected as the site of the Free Hospital for Poor Consumptives soon to be erected.

EAGLESMERE, in Sullivan County, is popular as a summer resort with the people of Williamsport and Philadelphia. The lake has an elevation of 2000 feet, and its shores are lined with cottages and hotels that are well filled during the season. Care should be exercised as to bathing in the lake. Children are inclined to overindulge, and, while the bathing grounds are safe, the ill effects of too prolonged bathing in fresh water are not to be overlooked.

The air is pure and cool. Visitors need heavy clothing, and occasionally furs in the evening. The mean maximum temperature for July is 73° F., and for August, 70.7° F. The mean minima for the same months are 53° F. and 57° F. The mean daily range is 15° F. The mean humidities are 82 per cent. and 80 per cent. The annual rainfall is 73 inches, and the snowfall 142 inches.

MINNEQUA, in Bradford County, on the line of the Northern Central Railway, near the New York State-line, is in the midst of a rich farming and dairy country, at an elevation of 1500 feet above tide. The maximum temperature recorded in summer is about 88° F. The spring contains 7.6 grains of total solids in a gallon, composed of sodium borate, calcium carbonate, and magnesium carbonate. It possesses one hotel, which is open from June to October.

KANE, in northwestern Pennsylvania, at an elevation of 2000 feet, is situated on the broad highland at the summit of the watersheds of the Ohio and Susquehanna Rivers. The country is diversified, rough, and mountainous, and covered with forests of hemlock and spruce. The winters are long and the summers cool. It is the driest region in Pennsylvania, and is noted for its stimulating climate and for the vigor of its inhabitants. The mean maximum temperature for June is 75° F., and for July, 80° F. The mean minimum temperature is 52° F. and 55° F. for the same months. There is a small hospital at Kane conducted by the Drs. Kane, and a fairly good hotel, open all the year. The region is excellent for cases of **chronic pulmonary tuberculosis**.

CAMBRIDGE SPRINGS, in western Pennsylvania, on the Erie Railroad, fourteen miles from Meadville, and about sixteen hours from New York, is a favorite resort for the people of Pittsburg, Cleveland, and Buffalo, on account of its mineral springs. The springs are of

various kinds—chalybeate, calcic, and contain magnesia and lithia. They are of value in diseases of the **stomach, liver, urinary organs**, and in **general hyperacidity**. The hotels are large and well kept. The Hotel Rider, the Hotel Riverside, and the Highland Hotel afford good accommodation; the first of these is open all the year, and has accommodations for 600 guests.

WERNERSVILLE, in Berks County, possesses two or three **sanatoriums**, favorably situated on hillsides, amid pleasant and healthful surroundings. They are suitable for persons of moderate means, and are not limited to any special class of cases. The mean annual temperature is 51° F.; the precipitation, about 40 inches. A large State hospital for the insane is located here.

CRESSON (2000 feet) is a well-known resort on the main line of the Pennsylvania Railroad, on the crest of the Alleghany Mountains. The climate is dry. The soil is sandy, and the drainage and water-supply are excellent. There are two weakly mineralized springs. It is a suitable place for the **tuberculous**. There are numerous cottages.

BUENA VISTA, a summer resort in Franklin County, on the summit of the Blue Ridge, nearly 2000 feet above tide, and one mile from the Maryland State-line, is reached in two hours from Baltimore *via* the Western Maryland Railroad. The air is dry, and favorable for **pulmonary diseases**. The spring-water contains 0.63 grain of solid constituents to a gallon. The annual precipitation averages 38 inches. The mean annual temperature is 51° F.

BEDFORD SPRINGS (1080 feet), in Bedford County, is a mountain spa. The waters consist of the Main Spring, containing a trace of lithium chlorid, 107 grains of calcium sulphate, and 32 grains of magnesium sulphate to the gallon; the Bowling Alley Spring, with 84 grains of calcium sulphate and 33 of magnesium sulphate; the Sulphur Spring, slightly weaker in earthy salts and with a small quantity of hydrogen sulphid; the Chalybeate Spring, and the Pure Spring. They are used in the constipation of **neurasthenia, hysteria with dyspepsia, Bright's disease, hepatic torpor, chronic gout, and gouty diabetes**. In connection with baths and exercise, great benefit follows in many cases. The waters are counter-indicated in skin diseases, syphilis, angina pectoris, and advanced

Bright's disease. Their medicinal virtues have been known and employed for one hundred years.

GETTYSBURG, in Adams County, is famous as the site of the decisive battle of the Civil War. The water of the 'Katalysine Spring' is alkaline earthy, containing 16 grains of solids in a gallon, and is said to be useful in **gouty** and **rheumatic conditions**, and in **catarrh of the alimentary tract**. There is also a lithia water. BLACK BARREN MINERAL SPRING (600 feet), in the southern part of Lancaster County one mile from the Susquehanna River and three miles from the Maryland line, is a pleasant resort from May to October. The water is mild alkaline sulphated. CARLISLE SPRINGS, in the Cumberland Valley, are mildly sulphureted. The CLOVERDALE LITHIA SPRING, also in Cumberland County, yields a weakly gaseous alkaline chalybeate water, having antacid, aperient, and tonic effects.

MARYLAND AND THE DISTRICT OF COLUMBIA

MARYLAND

This State has an area of over 12,000 square miles and a population of 725,000. The mean temperature for January at Baltimore is 34° F.; for July, 78° F.; the annual amount of precipitation is 43.8 inches. In the eastern part of the State malaria is common.

BALTIMORE, the seat of Johns Hopkins University, is a city of 508,000 inhabitants. It lies in latitude 39° 17' north, on an estuary of the Patapsco River, twelve miles from the head of Chesapeake Bay. Built on a succession of eminences, it is picturesque, elegant, and well kept. There are several parks and large public squares. It is of great commercial importance, attractive socially, and for a large city agreeably quiet. The summers are long and sultry; the winters are mild, and it is then a desirable place of residence. The mean annual temperature is about 55.7° F. The recorded extremes, due respectively to hot and cold "waves," are 104° F. (1898) and —7° F. (1899). The mean relative humidity at 8 A.M. is 72 per cent. and at 8 P.M. 68°. The average amount of wind is 5.2 miles hourly. Its easy access to Washington (less than one hour by rail) adds to

the resources of Baltimore in art, bibliography, and science, the treasures of the national capital.

DEER PARK (3000 feet), Garrett County, is a summer resort on the Baltimore and Ohio Railroad, on the summit of the Alleghany Mountains. There is an excellent hotel, with Turkish and Russian baths, swimming pool, and opportunity for outdoor amusement.

There are five **mineral spring** resorts in Maryland, not very widely known outside of the State. STRONTIA SPRING (600 feet) is only nine miles from Baltimore. The water is muriated alkaline earthy with a slight amount of strontium sulphate and bicarbonate. It is used as a table water, and is said to have tonic, diuretic, and alterative properties (Crook). BENTLEY'S SPRINGS (600 feet), in Baltimore County, are thirty miles from Baltimore and seventy miles from Washington. They are weak alkaline earthy. The CHATTOLBANEE Springs in the same locality are of the same character.

The FLINT STONE SPRINGS (925 feet) are in Alleghany County, twelve miles from Cumberland. They are alkaline earthy, containing 174 grains of solids in a gallon. MARDELA SPRINGS (200 feet), in Wicomico County, twelve miles west of Salisbury, are located in a region pleasant for summer sojourn. The water is chalybeate with a strong trace of arsenious acid. It is useful in **anemia**, in **dyspepsia**, in **cystitis**, and in **functional pelvic disorders** of women.

THE DISTRICT OF COLUMBIA

The District of Columbia has an area of seventy square miles and a population of over 287,000.

WASHINGTON, the capital of the United States, situated in latitude $38^{\circ} 53'$ north, has a population of over 230,000. The Capitol, one of the great buildings of the world, the fine broad avenues, and the many distinguished men from every nation to be seen here, make this a city of peculiar interest. Climatically it is much like Baltimore, but somewhat warmer and moister, hence more oppressive from June to October. The mean annual temperature for January is 33° F.; for July, 77° F. There are 43.5 inches of precipitation annually. A further account of Washington is given in the chapter on "Towns of the United States."

CHAPTER XXI

THE RESORTS OF THE UNITED STATES OF AMERICA—THE SOUTHERN ATLANTIC STATES

The Interior Resorts of Virginia, West Virginia, North Carolina, South Carolina, and Georgia.

VIRGINIA

The State of Virginia, known as the 'Old Dominion,' has an area of 42,450 square miles, and a population of over 1,600,000 inhabitants. It is level in the southeast and mountainous in the northwest and west and is traversed by the Blue Ridge and other ranges of the Appalachian system. At Lynchburg, a little to the southwest of the center of the State, the mean temperature for January is 36° F.; for July, 78° F. There are 42.8 inches of precipitation annually.

RICHMOND, the capital of Virginia, and interesting as the sometime capital of the Confederacy, is located at the lower falls of the James River, 150 miles from its mouth, 95 miles southwest from Washington, and in 37° north latitude, 77° west longitude. The city is built on Richmond and Shockoe hills, on the latter of which are the State Capitol and public buildings. The scenery for miles around is very beautiful. Richmond has a distinctive social tone, and good educational facilities. It is an important railway center and is in communication by steamship lines with Norfolk, Baltimore, Philadelphia, and New York. The district between the James and Potomac Rivers (at the lower border of which Richmond is located) is malarial in spring and fall, but more salubrious in winter. Although the region near Hampton Roads, possessing a climate agreeable and healthful at all seasons, is more attractive to tourists; and the Valley of Virginia, sheltered by mountains from intense cold in winter, and enjoying elevation and cool breezes, is more restorative for invalids, Richmond, too, possesses a dry and healthful climate,

and may well be visited in the autumn and winter by the aged, and by those seeking rest and diversion. Its winters are mild and short; its summers are usually very hot.

There are some sixty odd localities in Virginia, nearly all located in the western portion of the State in the Alleghany and Blue Ridge Mountains, where **mineral springs** of greater or less reputation are found. The waters are of almost every variety, largely alkaline sulphated, alkaline earthy, sulphurous, and chalybeate. Many are thermal, some contain lithium, and one contains arsenic. As a rule, there are well-kept hotels or comfortable boarding-houses at these places, and some are highly developed resorts.¹

We shall first mention some of those in the southern central portion of the State and then proceed from northeast to southwest along the West Virginia and Kentucky borders and their vicinity. POWHATAN Lithia and Alum Springs are in Powhatan County. OTTERBURN Magnesia and Lithia Springs are in Amelia County. COLEMANVILLE MINERAL SPRINGS, in Cumberland County, are weak alkaline chalybeate and alkaline earthy. FARMVILLE Lithia Springs (550 feet), in Prince Edward County, are 72 miles south of Richmond. The region is historic; the climate is hot in summer and mild in winter. The water is gaseous alkaline earthy, with 3.76 grains of lithium bicarbonate in a gallon. It is widely sold and is useful in the treatment of **gout, gouty dyspepsia, nephritis, and renal and vesical calculus**. GLENOLA SPRINGS (500 feet), in Nottoway County, have weak gaseous iodo-alkaline water. BURKEVILLE has sulphated and chalybeate waters, called 'Antidyspeptic and Tonic Springs.' BUFFALO LITHIA SPRINGS (150 feet), Mecklenburg County, are gaseous, alkaline, earthy, sulphurous. Spring No. 2 contains lithium carbonate, about 2.25 grains in a gallon. Its water has an extensive sale throughout the United States. The resort is pleasant from June to October, and has a well-equipped bathing establishment.

With Frederick County, we begin to name resorts of greater

¹ Analyses and descriptions of most of them have been published by Dr. J. K. Crook, "Mineral Waters of the United States and Their Therapeutic Uses," Philadelphia, 1899. Acknowledgments are made to Dr. Crook for assistance from this source.

elevation in the border mountains. JORDAN'S WHITE SULPHUR SPRINGS (1200 feet) are alkaline sulphureted. The water is useful in the treatment of **gout** and **rheumatism**. Accommodations and bathing facilities are good. The resort is pleasant in summer. ROCK ENON Springs (1200 feet) has a strong sulphated chalybeate water, also an alkaline spring and sulphur springs. In Fauquier County, FAUQUIER WHITE SULPHUR SPRINGS (1000 feet) are pleasantly situated in a beautiful and quiet region near the Rappahanock River. The resort is well sheltered, so that invalids can be much out-of-doors at any time of year. The walks and woods are attractive. The waters are alkaline chalybeate, and are of use as a **diuretic** and in the treatment of **neurasthenia** and of **menstrual disorders due to anemia**. In Shenandoah County, are ORKNEY SPRINGS and BURNER'S SPRINGS (1500 feet), near Woodstock. The latter are said to be useful in **gout** and **rheumatism**. There is no hotel at present. In Rockingham County, RAWLEY SPRINGS (2000 feet) is a famous old resort. The waters are mild, gaseous, chalybeate, and useful in the **anemias**. MASSANETTA SPRINGS (1350 feet) are alkaline chalybeate waters. In Augusta County, near STAUNTON, a pleasant and prosperous little town in the beautiful valley just northwest of the Blue Ridge, are the VIRGINIA MAGNESIA LITHIA SPRINGS, and the VIRGINIA WAUKESHA LITHIA SPRINGS.

HOT SPRINGS (2300 feet) in Bath County, on a branch of the Chesapeake and Ohio Railway, fourteen and a half hours distant from New York, has in recent years come to be the best-equipped and most fashionable of the southern watering-places. The hotels are well kept, and are as popular with pleasure-seekers as with those who go for the medicinal virtues of the springs. The Virginia hotel provides first-class accommodations, and there are ten new cottages. The New Homestead Hotel was destroyed by fire in July, 1901, but will be immediately rebuilt. The bathing establishment is a luxurious building with every modern appliance. There is a casino, and there are golf-links and a choice livery. Fox-hunting is a favorite sport at the Springs. The waters are alkaline earthy and sulphated; the temperature of the bathing springs being from 106° to 108° F.; that of the drinking spring, 74° F. They are used successfully for the relief of **chronic rheumatism** and **gout**.

The WARM SPRINGS (96° F.), with gaseous earthy sulphated waters, are about five miles, and the HEALING SPRINGS four miles, distant. The waters of the latter are gaseous alkaline earthy and sulphated, and have been likened to those of Schlangenbad and Ems. Not far away are MILLBORO (2000 feet), with weak gaseous alkaline sulphureted waters; WHALLAWATOOLA ALUM and BATH ALUM SPRINGS, the latter acid chalybeate and aluminous. This vicinity is not a desirable place for a prolonged summer visit. The most suitable seasons are from May 1st to June 15th, and from September 1st to November 1st. Hay-fever sufferers will not find relief in this locality.

In Alleghany County are CLIFTON SPRINGS, near Clifton Forge, and SWEET CHALYBEATE SPRINGS (3000 feet), with earthy chalybeate waters, used internally and externally in the treatment of **anemia**, **leukorrhea**, and **neuralgia** due to poverty of the blood. In Rockbridge County are ROCKBRIDGE ALUM SPRINGS, acid chalybeate and aluminous. The waters are used internally for the treatment of **atonic** and **catarrhal affections** of the mucous membranes, as chronic diarrhea, leukorrhea, pharyngitis, and rhinitis. They are widely sold throughout the United States. The JORDAN ALUM SPRING is in the same locality. COLD SULPHUR SPRINGS (2000 feet) are gaseous sulphurous chalybeate, containing 253 cubic inches of hydrogen sulphid in a gallon. In this county is the celebrated NATURAL BRIDGE over Cedar Creek. The region is healthful and suitable for a visit in summer. In Botetourt County, DAGGERS SPRINGS is a pleasant resort in the foothills of the Blue Ridge, with sulphur, iron, and lithia springs. BLUE RIDGE SPRING, with free carbonic acid and sulphureted hydrogen, contains much calcium sulphate. The most frequented summer resort in Roanoke County, and one of the best in the Virginia mountains, is ROANOKE RED SULPHUR SPRINGS (2000 feet), with gaseous alkaline sulphureted waters. The 'Flowing spring' is a variety of geyser. There is also a chalybeate spring containing free carbon dioxid. These waters have a good reputation for usefulness in chronic affections of the **respiratory** passages. In Campbell County, about ten miles southwest of Lynchburg, are BEDFORD ALUM, IRON, AND LITHIA SPRINGS, with acid chalybeate and aluminous waters. In Mont-

gomery County is the CROCKETT ARSENIC-LITHIA SPRING (2000 feet). The water is subthermal, having a temperature of 70° throughout the year. It is not rich in mineral ingredients, but contains a great variety of them. It is employed in the chronic types of **skin disease** both internally and by baths. It possesses a sedative and tonic influence on the nervous system and is used as a general tonic in the same classes of cases as are pharmaceutic preparations of arsenic. The hotel and bathing establishment are excellent. ALLEGHANY SPRINGS are alkaline and earthy sulphated. YELLOW SULPHUR SPRINGS (2000 feet) are rich in calcium, magnesium, and aluminum sulphate, with calcium, magnesium, and iron carbonate. The water is valuable internally in the treatment of **amenorrhea**, **dysmenorrhea**, and **leukorrhea**. Externally the water is used for the treatment of **rheumatism** and chronic **skin diseases**. MONTGOMERY WHITE SULPHUR SPRINGS (2000 feet) is a cool, invigorating, and attractive summer resort. The water is laxative, diuretic, and diaphoretic. The principal salts are sodium, calcium, and magnesium sulphate. About twenty miles distant, in Giles County, near the West Virginia line, accessible by the Norfolk and Western Railroad *via* Radford, is MOUNTAIN LAKE, the coolest summer resort in Virginia. Its altitude is 4800 feet. At this elevation the visitor finds himself very often above the clouds, and the remarkable scenery and effects of sunlight on the mountain tops render it well worth a visit.

In Pulaski County, HUNTER'S PULASKI ALUM SPRINGS (2000 feet) have earthy chalybeate waters useful in **dyspepsia**, **diarrhea**, and **dysentery**. In Wythe County, near Wytheville, are NYE LITHIA SPRINGS (2360 feet), alkaline-lithic, alkaline-chalybeate, and lithic-calcic waters, useful in the treatment of **dyspepsia** and of **menstrual disorders** depending on **anemia**. In Tazewell County are BUCKINGHAM WHITE SULPHUR SPRINGS, CEDAR BLUFF SULPHUR SPRINGS, and IRON LITHIA SPRINGS (2700 feet), with sulphated, alkaline, aluminous, and chalybeate waters. CLAYFORD CHALYBEATE SPRINGS (3100 feet) are twelve miles by pike-road from Tazewell. The surrounding region is picturesque, and Groseclose Inn, in the romantic sheltered valley known as BURKE'S GARDEN, is but two miles distant. The water is useful in **anemic conditions**, and the region is well suited for a health resort. WASHINGTON SPRINGS (2250 feet),

Washington County, are weak alkaline earthy sulphureted. HOLSTON SPRINGS, Scott County, are alkaline and earthy sulphated. The temperature of the water is 68.5° F. HUBBARD SPRINGS (1450 feet), Lee County, have 'white sulphur,' 'black sulphur,' and chalybeate waters. There are no satisfactory accommodations for visitors.

WEST VIRGINIA

The **mineral springs** of West Virginia are all in a beautiful, mountainous country, of great healthfulness and eminently suitable for summer residences. Geographically and climatically they belong to Virginia, as they did politically before 1860. In Monroe County, OLD SWEET SPRINGS (2000 feet) are alkaline earthy. They are subthermal, having a temperature of 79° F. The water is used in the treatment of **chronic diarrhea** and **dysentery**. There are excellent accommodations. RED SULPHUR SPRINGS, on Indian Creek, are surrounded by pine-clad mountains. The water is weak, gaseous, alkaline earthy sulphurous. It is sedative to mucous membranes and steady to the heart, and has proved useful in **chronic pulmonary** and **bronchial affections**, **hemoptysis**, and **early tuberculosis**. SALT SULPHUR SPRINGS (2000 feet) are alkaline earthy sulphurous, and containing considerable quantities of sodium, calcium, and magnesium sulphates, are useful in the treatment of **chronic constipation**.

The typical Southern watering-place is GREENBRIER WHITE SULPHUR SPRINGS, in Greenbrier County. It has been used for over a century, and is characterized by a quaintness and tone of Southern elegance and comfort scarcely to be found elsewhere. Various improvements, including a new water-supply, sewerage system, and conveniences which are not always found in old-fashioned Southern watering-places, make it a representative resort. The Springs are on the main line of the Chesapeake and Ohio railway at an elevation of 2000 feet, close to the Virginia boundary. The surrounding mountains rise 3500 feet, and are clothed with oak, maple, and pine. The locality is especially suitable for invalids or delicate persons during the spring, summer, and autumn. It is rarely oppressively hot and is generally cool morning and evening. There

are sulphur and chalybeate springs. The sulphur spring contains in each gallon : calcium sulphate, 67 grains ; magnesium sulphate, 30 grains ; magnesium chlorid, 0.8 grain ; calcic carbonate, 6 grains ; carbon dioxid, 11 cubic inches ; hydrogen sulphid, 0.27 inch. The flow is thirty gallons a minute. The chalybeate spring contains iron carbonate. The sulphur water is used internally for **affections of the kidneys, liver, and skin**. The baths, from the same source, consist of Turkish, Russian, Roman, spout, and Nauheim. Massage is also given. The waters seem to have a beneficial effect, in connection with the advantages of climate, in **hay-fever, chronic nasal catarrh, asthma, and bronchitis** ; and when the hot sulphur baths are used, **rheumatism, gout, and malaria** are favorably influenced. There is a swimming-pool.

There is a great deal to entertain the visitor. The hotel is very large and accommodates 1200 persons. There are rows of cottages near the hotel bearing the names Baltimore row, Georgia row, South Carolina row, Florida row, Alabama row, which show the localities of patronage ; there are frequent balls, horse-races, and other diversions that make the resort exceedingly popular.

In Morgan County, **BERKELEY SPRINGS** (800 feet) have weak earthy chalybeate waters. They are subthermal, having a temperature of 75° F., and are useful in the treatment of **gout, sciatica, dyspepsia, and rheumatism**. There are also two strong chalybeate springs. **SHANNONDALE SPRINGS**, in Jefferson County, are sulphated earthy chalybeate, with hydrogen sulphid.

BLUE SULPHUR SPRINGS, in Cabell County, is a quieter resort, not so well equipped, but of much the same medicinal value as the White Sulphur. **CAPON SPRINGS**, Hampshire County (1800 feet), is also an excellent resort ; the waters are weak alkaline earthy, containing 12.14 grains of solids per gallon. They are useful in the treatment of **dyspepsia, uric acid, and gastric and vesical catarrh**. There is a swimming-pool, and warm baths are employed. **BORLAND MINERAL WELL**, in Pleasants County, has an alkaline muriated sulphurous water. **ADDISON SULPHUR SPRINGS** (1400 feet), attractively situated in Webster County, have strong muriated and earthy sulphureted waters useful in chronic disorders of the alimentary tract.

NORTH CAROLINA

Of all the Southern States, North Carolina possesses the most interesting variety of climate. Its 300 miles of seacoast are characterized by long, shallow sounds connecting with one another, but communicating imperfectly with the ocean. Nowhere on the Atlantic coast is the sea rougher than off Cape Hatteras and Cape Lookout. At Hatteras the records of the Weather Bureau show a greater aggregate velocity of wind than at any other point in the United States save the top of Pike's Peak and Block Island. It is a proverbially dangerous coast. Although there are over twenty inlets, the harbors are approached with difficulty. The shore is low and sandy, like all the South Atlantic coast, and long and narrow strips of land form a natural breakwater, behind which are the sounds; the ocean front is not available, therefore, as a resort. The sounds afford pleasure-seekers good bathing and sailing. Currituck, Albemarle, and Pamlico Sounds are famous for their duck shooting.

SOUTHERN PINES and PINEHURST, three miles apart, are seventy-five miles southwest of Raleigh, in the 'pine belt' of North Carolina. **Tuberculous patients** are received at Southern Pines and do remarkably well there, but they are not desired at Pinehurst. Accommodations are excellent at both places, and visitors often rest at these resorts *en route* to Florida and Georgia. The air of the pine belt is well adapted for the relief of **bronchitis**, and the general conditions are favorable to those **convalescing** from acute illness or suffering from **chronic Bright's disease**. The season lasts from November to April, and the hotels cater to the needs of Northern guests. The country is flat and sparsely wooded, sandy, and rather uninteresting. There are golf-links at Pinehurst.

FAYETTEVILLE, on the Cape Fear River, is a quiet Southern town suitable for winter residence. The soil is sandy and there are extensive vineyards for the growth of the famous scuppernong grapes.

Far more interest centers in the western part of North Carolina than in the remainder of the State. Buncombe, Madison, Yancey, Mitchell, and McDowell Counties are resorted to by a steadily increasing number of visitors.

ASHEVILLE, the most conspicuous resort, has one of the most

attractive situations and invigorating climates to be found in the entire South. Situated at the confluence of the French Broad and Swannanoa Rivers, among the foot-hills of the Black Mountain range, it commands delightful mountain scenery. Its altitude of 2339 feet is higher than that of any health resort in New York or New England, affording one of the most desirable elements of a climate for pulmonary cases. The mean annual temperature in 1897 was 55° F.; the maximum was 95° F., and the minimum —2° F. The mean temperature in May is about 60°, and in June 70° F. The last frost is about the middle of April. The mean annual rainfall is from 40 to 45 inches, and the relative humidity about 65 per cent., which is as low as can be found in the State. The climate is well adapted for the treatment of pulmonary disease during the spring, summer, and autumn. In January, February, and March there is a good deal of cold weather, and the mud is a disagreeable feature at that time of the year, interfering considerably with out-of-door exercise. The soil contains clay mixed with sand, and there are no swamps or lakes in the entire region. There is no malaria.

WAYNESVILLE (2800 feet), in Haywood County, twenty-five miles west of Asheville, is a beautifully located town. The water of the Haywood Sulphur Springs, one mile distant, resembles that of Greenbrier, West Virginia, although the flow is much less. A hotel adapted only for summer use affords fair accommodations. An invalid who does not need much medical attention might be very comfortable here. The opportunities for sport are excellent.

HENDERSONVILLE, twenty-two miles south of Asheville, is chiefly a summer resort. It has a population of 1600, and is credited with having the lowest general death-rate in the State. There are six hotels and boarding-houses.

TRYON, forty-three miles south of Asheville, at an elevation of 1500 feet, is a mountain village on the southern slope of the Blue Ridge, in a picturesque location, commanding a fine view of the valley. There is one good small hotel.

MORGANTON, Burke County, at an elevation of 1184 feet, has a commanding situation amid fine mountain scenery, and is protected from high winds. The soil is a red clay. Good water abounds, many of the springs being chalybeate. The mean winter tempera-

ture is 42.5° F., with a maximum of 73° F. and a minimum of 10° F. The air is pure, dry, and bracing, and of value in **malarial affections**, and in the summer in the treatment of **catarrhal and pulmonary disease**.¹

GLEN ALPINE SPRINGS, a summer resort fifteen miles west of Morganton, is situated at an elevation of 1500 feet. BLOWING ROCK, Watauga County, has an elevation of 4025 feet. The roads are reported as excellent, and the immediate vicinity is comparatively level. The soil is a yellowish, sandy loam. Accommodations for visitors are said to be good and ample. It is accessible by the Western North Carolina Railroad to Hickory, thence to Lenoir by a narrow gage road, and from Lenoir to Blowing Rock, a distance of twenty-two miles by carriage over a good road.

CRANBERRY is reached by rail from Johnson City, Tennessee, a distance of thirty miles. LINVILLE (altitude 3900 feet) is a new resort twelve miles by stage from Cranberry. It is provided with a modern inn.

The HOT SPRINGS of North Carolina (1325 feet) are thirty-five miles west of Asheville, near the Tennessee border, on the line of the Southern Railway. The air and soil are dry, and there are no fogs or high winds except on the mountain tops. The diurnal range of temperature is small. There is one comfortable hotel open all the year and a number of inexpensive boarding-houses. There is a modern bathhouse with sixteen pools. The alkaline earthy springs, twenty in number, are famous throughout the South for the treatment of **rheumatism**, rivaling the Hot Springs of Arkansas. BARIUM SPRINGS, Iredell County, forty miles from Charlotte, are valuable in the treatment of scrofulous affections.

SOUTH CAROLINA

The State of South Carolina has an area of over 30,000 square miles, and a population of 1,151,000. It contains mineral springs and many points of historic interest. The surface is level on the coast, and hilly and undulating in the interior. At CHARLESTON,

¹ The sewerage is by natural drainage in open drains.

spoken of among coastwise places in the next chapter, the mean temperature is 49° F. for January ; for July, 82° F. ; there are 56.7 inches of precipitation.

AIKEN (565 feet), a pretty village in the southwestern part of South Carolina, is seventeen miles from Augusta, Georgia, and 120 miles from Charleston. Its permanent population is about 3000, but during the winter and spring many cottages are occupied by Northern owners. The Highland Park Hotel, burned in 1897, was the principal house, but at present the accommodations are insufficient. The climate of Aiken is considered the driest east of the Rocky Mountains. The air is temperate—just cold enough to make out-of-door life enjoyable during winter and spring, and with abundant sunshine. The average temperature at 2 P.M. in November is 61.4° F. ; in December, 57° F. ; in January, 52.6° F. ; in February, 56.8° F. ; in March, 59.8° F. ; and in April, 71.7° F. From November 1st to May 1st there is an average of 154 clear days and 27 rainy and cloudy ones. The mean relative humidity is from 53 to 63 per cent., and the rainfall for the six months is 21 inches. There are numerous attractions at Aiken for the healthy and robust quite as much as for the weak and ill. Fox-hunting is a sport much indulged in here. A small sanatorium, established in 1896, incorporated as **The Aiken Cottages**, is for the care of indigent men with incipient pulmonary disease. It accommodates twelve patients, and the charges are low. The cottages are open from November to May 15th.

CAMDEN is a quiet southern town of 3000 inhabitants, in the sand-hill region of South Carolina, about 200 feet above sea-level. It is thirty miles from Columbia and twenty hours by rail from New York. The air is dry, balmy, and bracing ; the soil is well drained, and pine woods abound. The mean annual temperature is ten degrees higher than that of Philadelphia, and the rainfall is about 45 inches. There is no malaria. Camden is especially suitable for the relief of **throat and lung disease** in the early stages, **catarrh**, **asthma**, **general debility**, and **insomnia**. The Hobkirk Inn, Upton Court, and numerous boarding-houses furnish accommodations for guests.

SUMMERVILLE is twenty-two miles northwest of Charleston, and

seventy-five feet above sea-level. It is noted for its pines. These trees are protected by law and are well scattered throughout the town. The sanitary regulations of Summerville are excellent, and the Pine Forest Inn is favorably known.

CHECK'S SPRINGS (1200 feet), near Taylor's Station in Greenville County, and about four miles from Paris Mountain, a spur of the Blue Ridge, are situated in a region favorable for winter residence for fairly robust patients with **affections of the lungs**. The air is dry and the weather usually clear and bracing. The waters are gaseous earthy chalybeate and sulphurous, and are used in **dyspepsia** and **hepatic torpor**. GLENN SPRINGS (1000 feet), in Spartanburg County, and twelve miles from the pleasant town of SPARTANBURG, have an attractive situation in a hilly district. The accommodations are excellent. The alkaline earthy waters have a local reputation for usefulness in diseases of the **digestive tract**, and in **functional disorders of the pelvic organs** in women. HARRIS LITHIA SPRINGS, in Laurens County, are alkaline earthy and said to be useful in **diabetes mellitus** and **uric acid gravel**.

GEORGIA

The State of Georgia has an area of 58,680 square miles, a population of over 1,800,000 inhabitants, and possesses numerous sulphur and other mineral springs.

ATLANTA (latitude $33^{\circ} 45'$ north), the capital of Georgia, is a well-known city of 70,000 inhabitants, possesses an excellent climate, and is an example of a fine Southern metropolis. The mean temperature is 43° F. for January; for July, 78° F. The mean annual rainfall is 52 inches.

The BOWDEN LITHIA SPRINGS, at an altitude of 1200 feet, are one hour distant from Atlanta on the Georgia and Pacific Railroad. They contain a large quantity of bromin,¹ and are decidedly antacid and diuretic.

¹ According to N. A. Pratt, Chemist, Atlanta, in one gallon there are : Magnesium bromid, 15.23 grains ; potassium bromid, 5.29 grains ; lithium bicarbonate, 1.67 grains ; magnesium iodid, 0.73 grain ; calcium sulphate, 20.21 grains ; sodium chlorid, 124.49 grains.

The hotel at SWEET WATER PARK, situated amid great natural attractions, 1200 feet above tide, has accommodations for 200 guests. During the summer there is much to interest the visitor. Through the instrumentality of the late Henry W. Grady a summer school was established, on the plan of that at Chautauqua Lake, New York. The attendance amounts to over 600, made up chiefly of teachers, and the sessions last for about six weeks.

WARM SPRINGS, at an altitude of 1800 feet, in Merriweather County, south of Atlanta, have a temperature of 95° F. There are also, in the same locality, yellow and red sulphur, chalybeate, and other springs that have acquired a considerable reputation in Georgia and the neighboring States for the cure of **skin diseases, rheumatism, and gout.** The INDIAN SPRINGS, in Butts County, between Atlanta and Macon, are sulphurous and laxative, and efficacious in **jaundice, rheumatism, and dyspepsia.** They contain about seventy grains of magnesium sulphate to the pint, being thus the strongest of the kind in the United States. GREENBORO, half-way between Atlanta and Augusta, is a good health station.

MARIETTA, in Cobb County, twenty miles northwest of Atlanta, is a town of about 2500 inhabitants. It is somewhat cooler at all seasons than Augusta, the mean annual temperature being from 57° to 58° F. There are two small but well-kept, quiet hotels and several boarding-houses.

AUGUSTA is situated on the Savannah River, which forms the boundary between Georgia and South Carolina. Its elevation is 167 feet and it is one hundred miles from the Atlantic Ocean. It has a fine supply of filtered water. The general death-rate is 17.15 per 1000. It has a population of about 50,000 inhabitants, 40 per cent. of whom are negroes.¹ SUMMERVILLE, a suburb two and a half miles from Augusta, is 463 feet above tide, and overlooks Augusta. The soil is sandy and very porous, and the air is comparatively dry, the mean annual humidity varying from 73 to 78 per cent. In climate it resembles the well-known resort of Aiken, sixteen miles distant, situated on the same ridge. The air is bracing

¹ For further data see T. D. Coleman, M.D., "Transactions of the American Climatological Association," 1901.

and free from sudden changes, and in winter and spring is especially suited for the relief of **pulmonary** and **bronchial affections**. The sunny days throughout the winter and the spring make it suitable for **convalescents** from acute illness. The accommodations at the Bon Air on Summerville Heights, or Sand Hills, as the place is popularly termed, are first-class, and there are numerous well-kept boarding-houses.

THOMASVILLE, 380 feet above tide, has a well-established reputation as a winter resort. It is in a forest of pine, on sandy soil, at a distance from rivers, swamps, or lakes. The relative humidity is low—from 60 to 65 per cent. in winter. The mean annual temperature is 67° F. The air is mild and well suited to the comfort of the invalid. The beautiful drives through the pine forests are the main attractions of the place. The Piney Woods Inn, Mitchell House, and smaller houses are thronged with visitors during the winter and spring. Many visit Thomasville either before or after visiting Florida. One-half mile from Thomasville is the Country Club. Its property comprises 300 acres of park, five miles of well-graded drives and bridle paths, and an attractive club-house. There are golf-links and a pack of fox-hounds.

CATOOSA SPRINGS (950 feet), in Catoosa County, are 115 miles north from Atlanta and twenty-six miles south from Chattanooga, Tennessee. The surrounding country is rugged, Sandstone Mountain, about a mile distant, rising 1800 feet above sea-level. There is a large hotel and many cottages with good accommodations. The climate is bracing and invigorating even in summer (Crook), and is mild in winter, without sudden fluctuations of temperature. The Springs, fifty-two in number, are weakly gaseous, alkaline earthy, chalybeate, and weakly sulphureted. They are used in affections of the **stomach**, and to some extent in **chronic nephritis**.

CHAPTER XXII

SOUTHERN COAST RESORTS OF THE UNITED STATES OF AMERICA

South Carolina. Georgia. Florida. Mississippi. Louisiana. Texas.

SOUTH CAROLINA

CHARLESTON, in 32° north latitude, 79° west longitude, is an important port of entry, being built upon a low, level peninsula jutting into a spacious harbor, made famous by two wars. This harbor is guarded by Forts Sumter and Moultrie. The latter is located on SULLIVAN ISLAND, an attractive summer resort, on which are many handsome cottages. Its slight elevation above tide, however, exposes it to danger during heavy storms. The country surrounding Charleston is noted for its picturesqueness. It abounds in rice, cotton, oaks, magnolias, myrtles, and jasmynes. Several artesian wells in the city are mineralized. The water of the 'Old Artesian Well' is thermal (89° F.) alkaline muriated, containing about 136 grains of solids in a gallon. Charleston is a pleasant winter residence. The climate is favorable for some forms of pulmonary tuberculosis, though less suitable therefor than that of Aiken, further west.

GEORGIA

SAVANNAH, in the corner furthest north of the eastern (coast) line of Georgia, but far southward of the center of the State, is situated in latitude 32° north, longitude 81° west, on a sandy plain on the Savannah River, eighteen miles from the Atlantic Ocean. Though one of the largest cotton and naval-store exporting centers in the United States, the city has a population of but 65,000 (less than half of whom are whites), and is attractively provincial in character. The quiet tenor of its life, the neighborly and domestic character of its social pleasures, are among its chief charms for visitors seeking rest and change of environment. The town is beautifully quaint.

Around many of the brick or frame houses are gardens perennially blooming. The broad, palm-shaded streets are marked at frequent intervals by attractive 'squares,' and a public reservation of thirty acres—Forsyth Park—is located in the heart of the city. There are fine drives in and around Savannah. TYBEE ISLAND, a few miles out at sea, and readily accessible by train, is admirably suited to bathing and boating. The ISLE OF HOPE and THUNDERBOLT, summer resorts in the suburbs, lie on the Thunderbolt River, which, like the Savannah, is very muddy from the red clay hills through which the waters pass. The city water-supply, however, is from crystal-clear artesian wells. Small game exists in considerable abundance on the other side of the Savannah River. Near the city are extensive rice and cotton plantations. The climate of Savannah is very mild and, for the most part, warm. The mean temperature varies between 40° F. in the winter and 80° F. in the summer. Within recent years, however, the winters have been approaching in character those of Northern cities. Snow-storms are no longer occasions of wonder, though ice-skating is more rarely possible in Savannah than it is in Atlanta. Malaria and dengue fever are fairly common in the city, in large measure imported from the swamps along the coast to the south. There is direct steamship communication between Savannah and Boston, New York, Philadelphia, and Augusta, Ga.

BRUNSWICK, a town of 8500 inhabitants, about sixty miles to the south of Savannah, on St. Simon's Sound, an inlet of the Atlantic Ocean, has a peninsular situation and a mild climate. The temperature is equable and the air moist, the mean temperature in winter being 60° F. It is protected to some extent by pine forests on the north. The soil is alluvial. The water-supply is obtained from artesian wells 300 or 400 feet deep. Gunning and fishing are good. There is a hotel capable of entertaining 800 guests. CUMBERLAND ISLAND, twenty miles south of Brunswick, is a summer resort with ample facilities for surf-bathing, sailing, sea-fishing, and the like. It is very popular throughout the South. The climate is mild and especially suitable for patients with **nephritis** or **bronchitis**, or for **convalescents**. There are numerous cottages and a large, moderate priced hotel.

FLORIDA

Probably more has been written and a greater diversity of opinion expressed about the climatic advantages of Florida than concerning any other State in the Union. This great peninsula has a coast-line of 1150 miles, protected by a chain of over 10,000 low-lying sand islands or Keys. Its semitropic climate, tempered by the ocean, and its wonderful richness of vegetation have made it one of the most attractive winter resorts in the United States. There is no winter in southern Florida; ice has never been known; the weather of the winter months is such that life out-of-doors is full of enjoyment. The soil is sandy, and the central portion, rising in places to 300 feet above sea-level, abounds in pine forests and innumerable pure, clear, fresh-water lakes. The west coast of Florida is indented with beautiful bays; the shores are high and abound in hard woods, notably the live oak, once famous for ship-building. From St. Augustine to Miami are situated numerous winter resort hotels, unexcelled in beauty and convenience by any in the country.

Florida is visited probably oftener than any other State in the Union for the relief of **bronchial and pulmonary disorders**, and the disappointment that has attended many of the journeys has doubtless produced an unfavorable opinion throughout the medical profession. The prevailing belief at present is unquestionably that more can be hoped for, and that more is actually realized, from a climate less humid, of greater elevation, and in which a prolonged residence is possible with perfect comfort. At the best, Florida is only a temporary refuge for the consumptive; the hot weather, the rains, associated with the depressing influences of high humidity, cause a general exodus from nearly all Florida resorts at a time of year when sudden atmospheric changes are likely to occur in the north. The invalid must leave the semitropic home to which he has been accustomed and linger here and there upon the way before he may be allowed to enter a northern home. Even then, although he be assured his disease is in abeyance, he is not safe.

Whether or not the Florida climate will be found to be debilitating will depend on individual peculiarity in health and in disease

and as regards acclimatization. As winter merges into spring there are many days upon which those accustomed to a cold, bracing climate complain of the heat and relaxation. The daily temperature changes are not calculated to cause disease or discomfort. Fogs are not frequent, and even when they occur, the day usually ends pleasantly. The winter season, as a rule, is dry, with clear skies. While the Weather Service reports that the prevailing winds are northwest, it must not be understood that they greatly predominate; on the contrary, a very large proportion of the winter breezes are from the southwest, and are most delightful, and are usually accompanied by fair, dry weather. It is true that at long intervals during the winter there will occur a wet season, but this is not the rule.¹

Clothing worn in Florida should be of wool, and overcoats are indispensable on account of the proximity of the ocean and gulf. The sun is so warm and genial that one is deceived, and will probably at first bask in the sunshine without sufficient clothing. Visitors are likely to suffer from imprudence in this respect. Very little change, if any, in the character of dress is made during the day or from day to day, by the careful invalid. If his clothing seem too heavy at noon, he may remain in the shade or lighten the outer wraps. One should never put on thinner flannels until a decided and permanent change in temperature takes place. The use of oranges is doubtless a most excellent feature of the sojourn in Florida. Their perfection of development and absolute freshness render them not only enjoyable, but highly beneficial. Both bananas and oranges must be used with discretion, however, particularly in the case of children.

Owing to the vast coast-line of Florida its many harbors are exposed to the introduction of tropic diseases. Yellow fever is never endemic there, although it has at times invaded the State with terrible mortality. The quarantine service of Florida is now under the direction of the United States Marine Hospital Service.

JACKSONVILLE, situated on the St. Johns River, twenty-five miles from its mouth and thirty-eight miles from St. Augustine, on the coast, is the first city of importance in Florida. In 1900 its resident

¹ Dr. C. Drew.

population was 28,429. It is recovering quickly from the great conflagration of 1901. Jacksonville is a good starting-point from which to make excursions. The St. Johns River may be navigated as far south as Enterprise, 200 miles distant. This river has its origin among the springs and swamps of southern Florida, and may be traced for over 400 miles. Its banks are lined with luxuriant tropic vegetation. Among the most striking features are the great forests of cypress, robed in moss or mistletoe, and the graceful palms and palmettoes. For seventy-five miles the river has an average width of over three miles. South of Lake George, an expansion of this river, the stream is narrow ; its attractions to the sportsman are great ; the waters abound in fish, and the shores and forests are rich in game.

At ST. AUGUSTINE, in latitude $29^{\circ} 53'$ north, there is a modern hydrotherapeutic establishment, open from November until May. It is under the direction of physicians engaged by the Florida East Coast Hotel Co. There are skilled attendants and facilities for hot and cold baths, 'Nauheim baths,' electric baths, and massage.

DAYTONA is the terminus of the St. Johns and Halifax River Railroad, and is an attractive place. Like the Halifax River, the Indian River is simply a long, straight estuary of the ocean. The salt water enters by three inlets, and the rise and fall of the tide is slight. On the east a ribbon-like stretch of sand separates the river from the ocean, while on the west there is a long but narrow strip of rich land producing pineapples, bananas, cocoanuts, and the most famous oranges in the world.

ROCKLEDGE claims attention for its large number of cottages and hotels and excellent accommodations. There is no better place on the Indian River to rest than here. TITUSVILLE is also well spoken of. EDEN, JUPITER, JUNO, and LAKE WORTH are all claimants for the incoming tide of visitors. This entire region is a paradise for sportsmen. It must be said that Florida abounds in deadly serpents, chief of which is the diamond-back rattlesnake. These reptiles attain a large size, and fatal accidents are not uncommon.

ORLANDO, the chief town of Orange County, is situated south of the twenty-ninth degree parallel ; it is subject to less rapid changes of temperature than Jacksonville and other towns in northern Florida.

It is thirty miles from the Atlantic and sixty miles from the gulf, and at this distance the winds from the ocean are much drier and more agreeable than on the coast. The northwest winds, which prevail in Florida in winter, may chill the northern portion of the State, while in order to reach the southern half these winds must traverse the waters of the gulf and so lose much of their severity. The western shore receives the heaviest rainfall, and before reaching the interior of Florida the air has been robbed of much of its original moisture and is dry and warm.

WINTER PARK, Orange County, is in the midst of the lake region, 133 miles south of Jacksonville, forty miles from the ocean, and eighty miles from the gulf of Mexico. There are forests of pine, numerous lakes, and no marshes or stagnant ponds. The soil is sandy and free from malaria. The temperature in winter is from 60° to 65° F., and frost is a rarity. Winter is the dry season, but dew is heavy. Boating and fishing are good, and the accommodations for visitors are excellent. The Seminole is the principal hotel.

PALM BEACH, near the southern terminus of the Florida East Coast Railway, is now the most fashionable of all Florida resorts. Palm Beach and Miami have a distinctly tropic aspect, not observed in northern Florida. The season is necessarily short, and these places partake more of the nature of pleasure resorts than of health stations. At Miami there is convenient access by steamers to Nassau, New Providence, and to Havana. One of the diversions at Palm Beach and Miami is golf, and the links from St. Augustine south are well kept and under one management.

TARPON SPRINGS is a well-known resort at the upper end of the Pinellas peninsula, in southern Florida, on the gulf coast. The air is warm, reaching a temperament of 80° F. even in January and February, and rarely going to the freezing-point. The rainfall is light in winter, but heavy after May 1st. The average relative humidity is from 80 to 86 per cent. The climate is equable, moist, and well adapted to convalescents from bronchitis, pneumonia, or nervous disease, and there is much to entertain the visitor. The chief attractions are the tarpon fishing and the opportunities for sailing and sea-bathing.

TAMPA, on the Gulf of Mexico, at the terminus of the South Florida Railway, has a mean annual temperature of 72° F. Its relative humidity is 85 per cent., and there is 65 per cent. of bright sunny days. The climate is quite equable, and the opportunities for fishing and shooting are good. Tampa was, unfortunately, selected as a point for the embarkation of the United States troops for the Cuban campaign in the late Spanish-American War, and is associated in the minds of the American people with much distress and illness attendant on that expedition. This, however, took place during May, June, and July, and it should be remembered that visitors for health and pleasure should not be in Florida during that season.¹ Tampa is, nevertheless, a delightful winter resort, but is too damp for the tuberculous. The Tampa Bay Hotel is an extensive structure provided with every convenience, and is open during the winter months.

MISSISSIPPI

The State of Mississippi has an area of 46,800 square miles and a population of nearly 1,300,000 inhabitants. It abounds in **mineral springs**. In Marion, Marshall, Pike, Madison, and other counties there are alum springs, and in Clarke, Winston, and other counties there are chalybeate springs. It has a semitropic, healthful climate. The mean temperature at VICKSBURG for January is 47° F.; for July 82° F., and there are 55.7 inches of rainfall.

PASS CHRISTIAN and BAY ST. LOUIS are on opposite shores of Lake Pontchartrain. They are favorite summer resorts for residents of the States of Mississippi and Louisiana, and in winter they are visited by people from the north and west. The climate is mild in winter, and the breezes from the gulf moderate the heat of summer. It is warm and moist, and the rainfall is large. The coast is suitable for **bronchial diseases, nephritis, convalescence from pneumonia, malaria, and for general debility**. There are a number of hotels, and the cottages stretch for six miles along the water-front. There is much to enjoy, and the fishing especially is fine.

¹ For details on the fevers of Florida see article by F. Fremont-Smith, M.D., "Transactions of the American Climatological Association," 1901.

Near MERIDIAN, ninety-six miles east of Jackson, are the ARUNDEL LITHIA SPRINGS, a resort open from April to November. BILOXI, a well-known resort on the gulf, was destroyed by fire in November, 1900, but will, no doubt, be rebuilt.

LOUISIANA

Louisiana has a population of 1,100,000, contains 45,440 square miles, besides the lakes and bayous that indent the southern portion. Nearly half this extent is alluvial soil of unsurpassed fertility, lying on each side of the Mississippi River. Beyond this are the bluff and uplands, not over 500 feet in altitude, a fine cotton-growing country. The pinchill regions are beyond those and are well wooded. The prairie region extends across the State parallel to the line of the gulf, and between it and the hilly region, and is mostly marsh. The climate is unhealthful, and malaria is prevalent. On LAKE PONTCHARTRAIN there are some resorts, and sulphur springs are scattered throughout the State. The city of NEW ORLEANS is described in a later chapter.

TEXAS

This extensive and fertile State embraces 237,504 square miles, included between $25^{\circ} 50'$ north latitude and between $93^{\circ} 30'$ and 107° west longitude. The climate of Texas is diversified, for every variety of surface, mountain, plain, hill, and desert, is embraced within its limits.

No person in weak health should go to Texas from the North during the summer, nor should any invalid go into the country districts unless he is able to endure positive hardships and to subsist on the coarsest food. In parts of western Texas the water is strongly impregnated with lime, and care must be observed in its use by invalids, for it is not only disagreeable to the taste but irritating to the bowels. It should always be boiled before using. Hotels in Texas are usually of an inferior order.

GALVESTON, in latitude $29^{\circ} 18'$ north, the unfortunate seaport of Texas, has always enjoyed the reputation of being one of the most healthful cities in the State, notwithstanding its relaxing climate. The

midsummer heat is tempered by a pleasant sea-breeze. It has a fine beach. It lies between the gulf and the bay, in a perilous situation, and during the summer and autumn, the hurricane season, it is an unsafe place for residence. The terrible hurricane of September 7, 1900, that destroyed over 6000 lives in Galveston and its environs, has shown that it may be engulfed and wrecked as may any island of the West Indies.

SAN ANTONIO has an altitude of about 700 feet, and is situated in an undulating country free from marshes or bayous, and with swift running streams. In winter there is an average of fourteen days on which the temperature falls below the freezing-point.

LAMPASAS SPRINGS, sixty miles north of Austin, are much visited on account of the waters, which are said to resemble those of the White Sulphur Springs of Virginia. The country here is mountainous and healthful, but accommodations are very poor.

BOERNE, in southwestern Texas, thirty miles northwest of San Antonio, and 1550 feet above tide, is a small town of about 1000 inhabitants. It has a dry, moderately warm, equable climate, and is well suited for **tuberculous patients**. There are few boarding-houses, and living is inexpensive; it is off the beaten track, however, and has proved of value to tuberculous patients, especially young men who have improved sufficiently to accommodate themselves to out-of-door life and can indulge in some of the sports of a more primitive civilization. Originally a German hamlet, it has become well known as a health resort on account of its dry air—an atmosphere mild yet tonic. ‘Northers,’ of course, may occur, but they are not frequent except in the winter months. March is mild in this region, and April and May are the best months. These wind storms come on without warning, and the invalid must always be prepared for them. These northers may be quite cold when they enter the State from the north, but when they reach the neighborhood of San Antonio, they are so thinned down and subdued that they cause little trouble. There is said to be little or no malaria in the vicinity of Boerne.

EL PASO, in the extreme western corner of Texas, near the New Mexico boundary, is a city of 15,000 inhabitants. It has an elevation of 3764 feet, and from the middle of September until the middle

of May the climate is excellent for invalids. Its altitude renders El Paso a good place to begin the process of acclimatization to regions of greater rarefaction of air. Throughout this region the air is exceedingly dry and pure ; damp, chilly days and hot, sultry nights are unknown. The mean relative humidity during the season—from September until May—averages 49 per cent., and there are not more than three cloudy days on the average in a month. The soil is dry and porous, and the plateau on which the city is situated is protected on the north, west, and south by a spur of the Rocky Mountains. The mean temperature at 3 P. M. in January is 53° F. ; in February, 60° F. ; in April and October, 65° F. There is usually a fall of ten or twelve degrees by 11 P. M. There is rarely excessive cold. The winds are moderate, and there is no malaria and no fog. It is a good place for the working-man. There are several European plan hotels and one good boarding-house. The Hôtel Dieu, a modern, up-to-date hospital and sanatorium conducted by a Roman Catholic order, is a credit to the town.

CHAPTER XXIII

THE RESORTS OF THE UNITED STATES OF AMERICA—SOUTHWESTERN STATES

*Alabama. Tennessee. Missouri. Arkansas. Kansas. Nebraska.
Kentucky.*

ALABAMA

The State of Alabama, situated between latitudes $30^{\circ} 10'$ and 35° north, has an area of 52,250 square miles and a population of over 1,500,000. The climate is variable but healthful, except near the coast. At Mobile the mean temperature for January is 50° F.; for July, 82° F. The mean annual precipitation is 62.2 inches.

CITRONELLE, situated thirty-three miles north of Mobile and sixty-two miles from the Gulf of Mexico, in the pine forest of South Alabama, has an elevation of 360 feet. The drainage and water-supply are excellent, and there is said to be no malaria. The institution for tuberculous patients, for which Citronelle is well known, is a combination hotel and sanatorium, and is open all the year. The best months at Citronelle are from October until May.

TENNESSEE

This State has an area of 42,000 square miles and a population of over 1,700,000. It contains many sulphur and chalybeate springs. The mean temperature for January at Chattanooga is 41° F.; for July, 78° F. The annual amount of precipitation is 55 inches.

CLOUDLAND, a summer resort on the summit of Roan Mountain, on the dividing-line between North Carolina and Tennessee, has an altitude of 6394 feet. The hotel is visible for 100 miles, and is the highest building east of Pike's Peak, Colorado. The climate is cool and stimulating, and the mountain top is often amid the clouds. It is an excellent high altitude resort and is exempt from hay-fever. No person having cardiac or extensive tuberculous disease should

visit such an altitude, but others find much to interest them and very fair accommodations. The summit is reached by a road twelve and a half miles from Roan Mountain station, which is twenty-six miles from Johnson City. The mountain is covered with rhododendrons, is wooded to the top, well watered, and free from malaria.

CHATTANOOGA (762 feet) is a city of 50,000 inhabitants, on the southern bank of the Tennessee River. The neighboring battlefields of Chickamauga and Lookout Mountain lend great historic interest to the place. Although Chattanooga is a city, it is a charming Southern resort, picturesquely situated, and affording much to attract and entertain an invalid who needs an exhilarating, moderately warm climate at moderate elevation. There is 56 per cent. of possible sunshine throughout the year.

LOOKOUT MOUNTAIN, connected with Chattanooga by an electric road and cable cars, has a cool and invigorating climate and fine scenery. The **Chickamauga National Park** and other points made famous in the battles of the Civil War attract many visitors. The accommodations are excellent. This region is favorable for **tuberculous patients** and is off the beaten track of invalids. Chattanooga is accessible, and medical attention is readily obtained from that city.

MISSOURI

Missouri has an area of 69,400 square miles and a population of over 2,600,000. This State is agreeably diversified in surface, the section north of the Missouri River being prairie-land, and that south, mountainous. The climate is salubrious, although the winters are very cold and the summers long. There are numerous **mineral springs** throughout the State. AURORA SPRINGS (1000 feet), in Miller County, in a protected situation amid the beautiful scenery of the Ozark Mountains, have a tonic earthy chalybeate water, and good accommodations. BLUE LICK SPRINGS, AKESION SPRING, SWEET SPRINGS, and many other springs in Saline County furnish alkaline, earthy, chalybeate, and sulphur waters useful in the treatment of **digestive disorders**.

A description of the climate of St. Louis will be found in a succeeding chapter.

ARKANSAS

The State of Arkansas, between latitudes 33° and $36^{\circ} 30'$ north, has an area of 53,850 square miles, and a population of over 1,100,000. It is mountainous in the west and marshy in the east. The mean temperature for January at FORT SMITH is 34° F.; for July, 80° F. The mean annual temperature varies from 58° F. in the northern to 64° F. in the southern portion. The mean annual amount of precipitation is 44.7 inches. Malaria is common.

HOT SPRINGS (425 feet), in the Ozark Mountains, lies in a valley running north and south. There are seventy springs with temperatures ranging from 76° to 148° F. They contain 8.55 grains of solid constituents, chiefly calcium carbonate and silica, in a gallon. There are about 500 hotels and boarding-houses, and there are many physicians. It is best to direct patients to a physician one knows—at least by reputation—and trusts. This popular resort is owned by the United States Government, and leased to the various tenants. The income is applied to the improvement of the reservation, a tract of 911 acres. The quantity of water distributed to each bath-house is scrupulously controlled, and extortion is prevented by the schedule of charges approved by the Secretary of the Interior. There is a free Government bath-house, a most important institution and of great benefit to the indigent sufferers. There is a hospital for the officers and enlisted men of the army and navy.

The springs are used chiefly in the treatment of **syphilis** and **rheumatism**, and with excellent results. Syphilitics are subjected to "mercury by inunction most unsparingly, and potassium iodid internally in enormous doses," and, according to E. L. Keyes, this is just wherein the value of the springs seems to lie. A cure is effected even in desperate cases of late syphilis by means of the hot baths and the internal use of the water, which enable the patients to bear the drugs in greatly increased quantities. Broken-down, cachectic patients whose stomachs refuse to tolerate a sufficiently high degree of specific medication at home should be sent to Hot Springs.

Patients going to Hot Springs after a prolonged mercurial course

at home sometimes develop ptyalism after a number of baths, showing that the waters have an influence in eliminating the drug.

The POTASH SULPHUR SPRINGS (650 feet), six miles east of the Hot Springs, contain, besides sulphureted hydrogen, magnesium and sodium sulphates and calcium and magnesium bicarbonates. There are limited hotel accommodations. Fogs occur during the winter and spring, and high winds are common at that season.

KANSAS

Kansas, with an elevation from 750 feet in the east to 3800 feet in the west, has an area of over 82,000 square miles and a population of more than 1,400,000 inhabitants. The climate is dry, and the winters are short and mild. The mean temperature for January at Dodge City is 25° F.; for July, 78° F. The amount of precipitation annually is 19.8 inches. The State is fertile, but suffers from recurring periods of drought, one of which is in progress in the summer of 1901; large numbers of cattle have perished and farmers are in despair. In Kansas City the temperature rose to 104° F. on July 4, 1901, and again, later on, records of 100° were made throughout eastern Kansas.

At MANHATTAN, in Riley County, there are useful mineral springs. The TOPEKA mineral wells are alkaline muriated waters, useful in the treatment of *rheumatism*. The GENDA SPRINGS, of Cowley County, are alkaline sulphated waters.

NEBRASKA

The State of Nebraska is principally a high prairie-land, sloping from the foot-hills of the Rocky Mountains to the Missouri River. It has an area of 77,500 square miles and a population of over 1,000,000. The mean temperature at Omaha is 19° F. for January; for July, 76° F. The rainfall is 31.7 inches. The climate is mild and healthful.

KENTUCKY

BLUE LICK MINERAL SPRINGS, near Carlisle, Nicholas County, Kentucky, have muriated sulphur waters of moderate strength heavily charged with hydrogen sulphid and carbon dioxid. They

contain 79 grains of solid contents per gallon, of which 64 grains consists of sodium chlorid. The water is used successfully in the treatment of **dyspepsia, gout, chronic constipation, rheumatism, and cutaneous diseases.**

Among other springs in Kentucky there is at CRAB ORCHARD a purgative water, bottled and sold extensively in the United States. HARRODSBURG, in Mercer County, is now in disuse as a resort, but the water is a good example of the alkaline sulphated waters. At Louisville there is a strong alkaline sulphated artesian well.

LOUISVILLE is a town of social and commercial importance with fine educational advantages. The population is about 175,000. It is beautifully situated at the falls of the Ohio River, on a level plain 70 feet above low-water mark, and in the center of a fine fossiliferous region. Its mean annual temperature is about 55°, but liable to extremes of heat and cold. The climate, though variable, is usually pleasant, and in spring and summer is especially delightful. Winter and spring are usually marked by abundant rainfall.

CHAPTER XXIV

THE RESORTS OF THE UNITED STATES OF AMERICA—THE NORTH CENTRAL STATES

*Ohio. Indiana. Illinois. Michigan. Wisconsin. Minnesota. Iowa.
South and North Dakota.*

OHIO

The State of Ohio, covering an area of 41,060 square miles, lies between $38^{\circ} 27'$ north latitude, and between $80^{\circ} 34'$ and $84^{\circ} 49'$ west longitude. The surface of the State is an undulating plain, having a general elevation of from 1550 to 430 feet, and divided by a ridge of highlands extending from the northeastern corner to the middle of the western boundary. The waters of the northern slope formed by this division, which is much the smaller of the two, drain into Lake Erie, while those of the southern slope drain into the Ohio River. The climate of the latter portion is in general mild and healthful, the mean average temperature being from 52° to 54° F., although the heat is often intense in summer. The mean average temperature of the northern slope ranges from 48° to 50° F., but the winters are as rigorous as those of the States in the same latitude near the Atlantic coast. The temperature of the lake shore is pleasantly modified in summer by breezes from the lake. In the extreme southern part of the State the spring begins from eight to fifteen days earlier than in the extreme northern portion, as the region near the lake is chilled by winds blowing over the ice-fields that float down from the upper lakes. Throughout the State the autumn is remarkably genial. Winds from the northwest sometimes cause great changes in a few hours in winter; the thermometer has been known to fall sixty degrees in twenty-four hours, and changes of twenty or thirty degrees in a day have been recorded. Notwithstanding these sudden and severe variations, the climatic effects on human life and vegetation are

favorable. The average annual rainfall is greater in the southern than in the northern part of the State, the valley of the Ohio River showing 44 inches, while on the lake shore the precipitation is 32 inches.

CINCINNATI, the 'Queen City' (latitude $39^{\circ} 6'$ north), one of the largest cities in the West, is noted for the beauty of its suburbs and of the surrounding scenery. It is situated in the southwestern part of the State on the banks of the Ohio River. The city is built in three terraces, the last of which is on hills about 450 feet high. In hot weather these hills are popular summer resorts, as they are always cool and breezy. A gravel-bed underlies nearly the whole city, which furnishes it with excellent natural drainage. Cincinnati is said to be one of the most healthful cities in the United States. The average temperature in summer is 75.24° ; in winter, 34.28° .

CLEVELAND (latitude $41^{\circ} 31'$ north), in the northeastern part of the State, on the shores of Lake Erie, is known as the 'Forest City' because many of its streets are lined with trees. It is built on a plateau sloping from the lakes to an elevation of from 50 to 150 feet. In common with the other lake ports, it has the advantage of cooling summer breezes from the lake. The winter climate is moist and unfavorable for those having throat and lung affections. At the head of Lake Erie, near the mouth of Sandusky Bay, is a group of ten or fifteen islands, known as PUT-IN-BAY ISLANDS. This is the principal summer resort of Ohio. The largest of these islands furnish hotel and cottage accommodations. The scenery is attractive, and the clear and shallow waters of the lake and bay afford opportunities for boating, fishing, and bathing. The climate and soil of these islands are the best on the Atlantic slope for vine-growing. LAKESIDE, a summer resort on the shore of Lake Erie outside the mouth of Sandusky Bay, offers about the same attractions and accommodations as Put-in-Bay.

There are mineral springs in Adams County of the alkaline earthy chalybeate type. The FOUNTAIN PARK MAGNETIC SPRINGS, in Champaign County, are muriated alkaline earthy. The elevation is 1200 feet and the surroundings are attractive. The Sulpho-saline Spring of Cincinnati and the Stryker Mineral Springs of Williams County are of the alkaline muriated class. ERCKENBRECKER'S SALT

WELL, near Ludlow Grove, in Hamilton County, has a very strong brine used externally. It contains 4300 grains of sodium chlorid, 53 grains of iron chlorid, and 28 grains of sodium bromid in a gallon.

INDIANA

FRENCH LICK SPRINGS is situated in Orange County, 279 miles from Chicago and 80 miles from Louisville, on a branch of the Chicago, Indianapolis, and Louisville Railroad. The springs are in a valley, amid attractive surroundings. The **PLUTO SPRING**, discharging eighty gallons a minute, is a muriated sulphur water, carbonated. One gallon contains of magnesium sulphate 66 grains; calcium carbonate, 40 grains; magnesium carbonate, 52 grains; calcium chlorid, 32 grains; sodium chlorid, 141 grains. This spring is used in the treatment of **chronic affections of the liver** and for **dyspepsia**. The water is concentrated and used in smaller quantities, to be diluted for internal use. It acts as a hydragogue cathartic. It is useful in **obesity**. The **PROSERPINE SPRING** is a medium strength water and used locally for **eye and nose affections** and for the **skin**. The **BOWLES SPRING** is a mild diuretic water. The **BATH SPRING** is a strongly alkaline water, unsuitable for drinking, but useful in the treatment of **rheumatism** and **affections of the skin**. There are good facilities for bathing; Turkish, Russian, electric, mud, sulphur, and shampoo baths are given. The natural temperature of these waters is 55° F.

MUDLAVIA is located at Kramer, near Attica, Warren County, Indiana, 120 miles from Chicago on the Wabash or Chicago and Eastern Illinois Railroad. The resort is valuable on account of its **mud-baths** and water, which contains sodium, magnesium, lithium, and calcium salts and silicon. Analysis shows twenty grains of solid constituents in a gallon. The mud is applied over the body of the patient, after which he bathes in the **lithia water**. The treatment is said to be successful in **rheumatism, gout, sciatica, eczema**, and in the reduction of **obesity**. There are good accommodations with a modern bath-house and competent medical supervision.

The **WEST BADEN SPRINGS**, in Orange County, are well known for their alkaline saline chalybeate waters. The hotel has recently been destroyed by fire.

ILLINOIS

Illinois is a level prairie of great importance agriculturally ; it has great extremes of temperature and its climate is not sought by invalids. There are no health resorts excepting at a few mineral springs. Its chief city, CHICAGO, will be considered further on.

The principal springs are the AMERICAN CARLSBAD Springs, of Washington County, yielding sulphated alkaline water ; GREEN LAWN Springs, of Jefferson County, muriated chalybeate ; MAGNESIA SPRING, Kane County, muriated alkaline ; MI-NI-YAN Springs, Kendall County, chalybeate ; PERRY SPRINGS, Pike County, weak alkaline earthy ; ZONIAN SPRINGS, Kane County.

MICHIGAN

This State is larger than Pennsylvania or New York, has about 2,500,000 inhabitants, and is of great commercial importance. The frontage on the Great Lakes is 1620 miles, and it has more than 5000 inland lakes. The climate of the State is modified by the proximity of these bodies of water ; it is subject to great extremes of temperature—from -35° F. to 108° F. The annual rainfall varies from 20 to 40 inches. Over 100 inches of snow falls in the northern peninsula. The relative humidity averages from 72 to 80 per cent. There is a preponderance of cloudy weather. Although exposed to severe climatic changes Michigan is a healthful State. Unusual vigilance is exercised by its Board of Health in repressing the spread of infectious diseases, and the public health is preserved so far as a wise administration of sanitary laws can accomplish it. There are innumerable summer resorts in Michigan on its lake front and in the interior that may be utilized for recreation and for health. There are ample opportunities for camp life and for fishing and hunting.

MACKINAC ISLAND (600 feet), a small island between Lake Michigan and Lake Huron, is probably the best-known resort in Michigan. The mean temperature for July is 69° F., and for August, 62° F. The mean annual temperature is 41° . There is a moderate amount of rain. There are excellent accommodations for about 4000. Bathing, boating, and fishing are good. MACKINAW was established by Marquette in 1671 and has a most interesting his-

tory. These stations are easily reached by rail and steamers. SAULT STE. MARIE, or 'The Soo,' lies between Lake Superior and Lake Huron, and is an interesting place for tourists.

MARQUETTE, on the south shore of Lake Superior, is a cool resort. There is no malaria or hay-fever, and it is an excellent station in summer for those who need a stimulating climate of moderate altitude. The mean annual temperature is 41.6° F. The mean maximum for July is 77.3° F., and for August, 70.6° F. The highest temperature ever recorded at Marquette was on July 15, 1901, when 108° F. was reached. But no matter how hot the days are, the nights are always cool. The relative humidity in summer is from 75 per cent. to 78 per cent. The prevailing winds are from the north and northwest and there is much cloudy weather.

Other resorts in Michigan are ALGONAC, on the St. Clair River; ARCADIA, fifteen miles north of Manistee, in western Michigan; BAY VIEW, near Petoskey, overlooking Little Traverse Bay; BAY PORT, forty-six miles northeast of Saginaw; BENTON HARBOR, sixty miles by water from Chicago on the western shore of Michigan; CHARLEVOIX, at the northern end of Lake Michigan; ESCANABA, on Green Bay, in the northern peninsula; GRAND HAVEN, on the mouth of the Grand River, 100 miles from Chicago.

MOUNT CLEMENS is much frequented for its mineral springs. These are strong brines, sulphureted. They are diluted for both external and internal use, and have a reputation for the cure of **chronic rheumatism** and **neuralgia**. The springs are twenty miles northeast of Detroit, and there are good hotels. ST. CLAIR SPRINGS, on the St. Clair River, fifty miles by steamer from Detroit, has a superior hotel open all the year, and all the attractions of a well-equipped health and pleasure resort. There is a strongly muriated earthy sulphureted water, useful in the **strumous diathesis**, and a gaseous alkaline muriated table-water, beneficial in **digestive disorders** and **chronic nephritis**. ALMA is situated in the pine regions of Michigan, and is favorably known in connection with the **Alma Sanatorium**, a well-equipped institution for the treatment of various **chronic diseases**. Baths, electricity, and gymnastics are employed under competent supervision. BATTLE CREEK, in southern Michigan, is also the seat of a large **sanatorium**.

WISCONSIN

Inasmuch as both Wisconsin and Michigan border on the Great Lakes, their climate is very similar. The extremes of temperature are not so great on the lake front as elsewhere. Along the western border of Wisconsin, adjacent to the Mississippi River, the winter temperature is about six degrees Fahrenheit colder than on the lake border, and five degrees warmer in summer. In the northern portion there are elevations of 1600 feet, and the interior is occupied by vast stretches of pine forest. The annual range of temperature is from 110° to 125° F. The midsummer temperatures are occasionally very high. On July 21, 1901, maxima of 104° F. were recorded in the southern part of the State. The rainfall varies from 21 to 30 inches.

In summer the climate is cool and bracing; the nights are almost without exception cool. The humidity is rather high. At La Crosse, in 1897, the record for the year at 8 A. M. was 81 per cent., but the rainfall was only 21 inches.

There is probably no place in Wisconsin specially beneficial for consumptives. There are, however, many attractive places of **summer resort** on the lakes, and some **spring waters** of value. **ASHLAND**, **BAYFIELD**, and **LA POINTE**, on Lake Superior, are desirable summer resorts. The shore of Lake Superior is extremely interesting and picturesque. Fogs are occasionally met with along the lake in the early summer. The climate is cool and invigorating. Patients suffering from **brain fag**, **mental depression**, or **melancholia** are wonderfully exhilarated. **Hay asthma** and the effects of **malaria** are greatly relieved. Ashland, Bayfield, and the Apostle Islands may be reached easily from Chicago by rail, or by the Lake Michigan and Lake Superior steamers. There are good hotels, open in summer for tourists. Camping and boating on Lake Superior is a therapeutic measure yielding surprising results in certain cases, and simply as a recreation is never to be forgotten. Guides, boats, and an outfit may be procured at Ashland, and the coast explored by sailing as far as Duluth. Gunning and fishing are excellent, and if it be preferred, fishing for trout and grayling, and deer hunting, may be enjoyed near the high transverse ridge.

In eastern Wisconsin, among other places, may be mentioned LAKE WINNEBAGO, forty miles long and thirteen miles wide, affording ample sport in fishing and yachting. North of Oshkosh, on Lake Winnebago, is NEENAH, another desirable point. SPARTA, GENEVA, DARTFORD, on Green Lake, ELKHART LAKE, and KILBOURN CITY in southern Wisconsin are attractive places in summer. WAUKESHA (800 feet), popular for its mineral waters, has been termed the Saratoga of the West. It is accessible from Milwaukee. About 10,000 persons visit Waukesha annually, and the waters have a wide sale throughout the United States. They are chiefly alkaline, chalybeate, and calcic. The best-known springs at Waukesha are the 'Bethesda,' 'Clysmic,' 'Fountain,' 'White Rock,' 'Silurian,' 'Vesta,' 'Glenn,' 'Horeb,' 'Gibson,' 'Siloam,' 'Mineral Rock,' and 'Vitaqua.' These waters contain from 18 to 36 grains of solids per gallon, chiefly magnesium and calcium bicarbonate. They are used in **gout, diabetes, and diseases of the urinary system.**

The ALLOUEZ Mineral Springs, at GREEN BAY, are muriated alkaline earthy. They are antacid and laxative. Green Bay is an attractive summer resort. The SHEBOYGAN Mineral Well, near Lake Michigan, yields a strong brine with 306 grains of sodium chlorid and 130 grains of calcium and magnesium chlorids, sulphates, and carbonates in a gallon. It is useful in **chronic constipation**, and for baths. From SPARTA MINERAL WELLS, in Monroe County, is obtained a chalybeate water containing nearly 12 grains of iron carbonate in a gallon.

OCONOMOWOC, in the lake region, on the north shore of Oconomowoc Lake, is a desirable resort. The principal lakes in this vicinity are PEWAUKEE, NAGAWICKA, PINE, and LA BELLE. The soil is a rather light, marly clay, with occasional loamy prairies. The underlying soil is mostly magnesian limestone.¹ DEVIL'S LAKE and GENEVA LAKE have an altitude of about 1000 feet. The **Sanatorium Waldheim** is located here and is favorably situated for the treatment of **chronic diseases**. Hydrotherapy is employed as an adjunct to treatment.

PALMYRA SPRINGS (850 feet) has a **sanatorium** with a capacity

¹ See Geological Survey of Wisconsin, vol. II.

for 200. The great geyser spring has an enormous flow. There is a moderate quantity of calcium and magnesium carbonate. The SHEALTIEL MINERAL SPRINGS (900 feet), at WAUPACA, have about a similar analysis, but fewer mineral constituents, containing 15 grains to a gallon. The soil in both places is sandy, and there are no fogs. The climate is bracing and subject to extremes of heat and cold. WAUWATOSA is the seat of the **Milwaukee Sanatorium**, a resort for nervous and mental cases.

MINNESOTA

The State of Minnesota has an area of over 83,000 square miles and a population of 1,300,000 inhabitants. At St. Vincent, in north-western Minnesota, minimum temperatures below zero were recorded in five months of the year; at St. Paul, in three months. At St. Vincent the mean annual temperature is 34° F.; at St. Paul, 43.7° F. The mean for July at St. Paul is 72° F.; at St. Vincent, 66.5 F. There is very little malaria, but rheumatism and neuralgia are common. Chronic catarrh of the air-passages and influenza are most frequently met with. Diphtheria, too, is a source of great mortality, especially in autumn and winter. Leprosy has occurred among the Scandinavian residents, and was studied by Dr. J. Armauer Hansen, of Bergen, Norway, who visited the United States in 1888.¹

Extremely cold weather is more comfortably borne in the climate of the Northwest than even moderately cold weather in the East. These low temperatures are usually obtained in a quiet atmosphere, and as the air is almost totally devoid of moisture, persons from the East are surprised to find how great a degree of cold they can bear without suffering.

The Minnesota National Park and Forest Reserve Association proposes the dedication, by the national Government, for park purposes, of a tract covering the present Cass Lake, Leech Lake, and Lake Winnibigoshish Indian Reservations. This area includes between 700,000 and 800,000 acres, of which from one-fourth to one-third is lake surface. It includes no State lands. Among

¹ See also Gronvald, "The Lancet," March 26, 1892.

other advantages of this project is the creation of a public park that shall serve as a health and pleasure resort and within which sanatoriums may be established for the treatment of **tuberculosis**. For this disease the region possesses a remarkable combination of qualities—a dry, pure air, a sandy soil, abundance of coniferous timber, and, finally, ample opportunities for out-of-door life and recreation.

ST. PAUL (800 feet), on the Mississippi River, in latitude 45° north, was widely recommended in former years as a health resort for the relief of **pulmonary tuberculosis**. It has been found, however, that the climate is too severe and too variable for respiratory diseases, but, on account of its bracing qualities, is better suited as a stimulant in nervous affections. This is, of course, equally applicable to MINNEAPOLIS, only six miles distant. The winters, though cold, are dry and invigorating; high winds are likely to occur at all seasons, and the neighborhood is not exempt from tornadoes in hot weather. In summer the temperature may reach 97° , and in winter, -27° F. The "twin cities" now have a population, combined, of 365,000 and afford all the advantages of modern civilization. In their early days as frontier towns they afforded opportunities for the sportsman that even now can be enjoyed by short journeys to neighboring lakes.

LAKE MINNETONKA, twenty minutes by rail from Minneapolis and forty minutes from St. Paul, has an area of twenty-three square miles and is very irregular in outline, having numerous bays and attractive shores. It is a popular summer resort for camping, fishing, and boating, and is well provided with hotels and cottages. The pure exhilarating air and opportunities for out-of-door life are unequaled in Minnesota. In midsummer the days are often hot, but the nights are always cool, and as a resort for the **overworked** and for **convalescents** it is excellent.

ALEXANDRIA, in Douglas County, on a chain of ten or twelve lakes, 144 miles northwest of St. Paul, is a good sporting country, with club-houses, camping grounds, and hotels. The climate is stimulating and has great diurnal and annual extremes.

SOUTH AND NORTH DAKOTA

SOUTH DAKOTA

HOT SPRINGS, on the southern border of the Black Hills, is at an altitude of 3450 feet, the mountains rising 1500 feet higher. The climate is cool and bracing and there is a great diurnal and annual range of temperature. The relative humidity is about 60 per cent., and the skies are generally clear. The annual rainfall varies between 11 and 17 inches. The dryness of the air is such that beef killed and cut into pieces for handling may be hung in the open air and will be preserved perfectly. There is little snowfall, and whatever falls is generally dissipated by the chinook winds. There are about seventy-five mineral springs, with temperatures from 86° F. to 96° F. They contain sodium, potassium, magnesium, and calcium sulphates, calcium chlorid, and magnesium chlorid, with carbonates and phosphates. There is a plunge bath, 50 by 250 feet, with a constant temperature of 96° F. There are ten hotels and a few cottages. Access is by the Chicago and Northwestern Railroad, in about thirty-three hours from Chicago. The chief advantages of this resort are for sojourn of those suffering with **pulmonary and bronchial affections**, and for the treatment, by baths, of patients having **subacute and chronic rheumatism**.

NORTH DAKOTA

This State forms part of the northern boundary of the United States and extends from the forty-sixth to the forty-ninth degree north latitude. It is a broad prairie, with many streams and lakes, but the average rainfall is only 18 inches. The wheat fields are the source of the wealth of the State. The climate is one of great extremes, the annual range of temperature being 156° F. The air is tonic and invigorating. The winters are clear and cold. The general death-rate is below 10 per 1000 inhabitants. **DEVIL'S LAKE**, in Ramsey County, is used as a resort. There are acid, sulphureted, and chalybeate springs. There are saline springs in Walsh, Pembina, and Nelson Counties, but they are poorly developed.

CHAPTER XXV

THE RESORTS OF THE UNITED STATES OF AMERICA—THE ROCKY MOUNTAIN REGION

General Physical Characteristics. Mountain Fever. New Mexico. Colorado. Idaho. Arizona. Wyoming. Indian Territory and Oklahoma. Montana. Utah. Nevada.

General Physical Characteristics

The Rocky Mountains, the most important mountain system in North America, traverse Arizona, New Mexico, Utah, Colorado, Idaho, Wyoming, and Montana. Among the special features of the Rocky Mountains are the cañons, geyser springs, and parks. Physicians recommending patients to the Rocky Mountain region will wish to know something of the so-called mountain fever.

Mountain Fever

Many febrile affections have been grouped under this head, but it is probably not a separate or distinct disease peculiar to that region. Every case of so-called 'mountain fever' may doubtless be classified under well-recognized headings if accurate diagnosis be made. Cases of typhoid fever, or malarial fever of typhoid type, croupous pneumonia, influenza, and toxic fever attending hepatic congestion have not been differentiated, but have loosely been designated 'mountain fever' so often that this term has become established in the popular and even to some extent in the colloquial professional nomenclature of disease in the mountain districts of the West. Many of the cases thus designated have, of course, been difficult of classification: those, for instance, of short duration and that vary widely from any standard or well-described type.

The clinical history of a case may be somewhat as follows: The patient will not have been feeling so well as usual for a few days. Possibly a chill will usher in the illness, and the temperature will be found at 101°, 102°, or even 104° F. It is said to remain almost

stationary until the approach of convalescence, and does not show that daily increase and the remissions that usually mark typhoid and remittent fever. There is anorexia; the tongue is not dry, but may be furred or may be almost natural throughout the illness. The skin is frequently dry, but without other peculiarities; the bowels may require a laxative. It is said ¹ that while the temperature does not generally exhibit diurnal changes, it may in some instances fall suddenly one or two degrees, remain at the lower point one or more days, and then as suddenly rise to its former height; or the diminution may be permanent and the further course of the disease be upon the lower temperature level, and this without reference to therapeutic measures. It is stated ² that quinin in large doses—thirty grains or more—seems powerless even to modify the temperature. The course of the disease varies greatly, but is usually short and tends to recovery. This, however, varies according to the class of cases that the physician of the locality has designated mountain fever. If cases of croupous pneumonia or cases of typhoid fever have been placed under this heading, the mortality may rise to 10 or 15 per cent.

Dr. R. G. Curtin ³ records four cases that had been diagnosticated in Montana as typical cases of mountain fever, but that, on careful examination, proved to be croupous pneumonia. He also states that while serving as assistant on the United States Geological Exploring Expedition under Professor Hayden, in 1868, he saw, in a hospital in Cheyenne City, Wyoming, four cases diagnosticated as 'mountain fever.' Two of the patients were prospectors who had been leading a nomadic life in the mountain fastnesses, usually at high altitude. The other two were persons who had been living in canvas tents while at home, and yet had often been called by business to the mountains. One of the patients died during the third week; no postmortem examination was made in his case. Diarrhea more or less severe was present in all cases. In one case a doubtful 'tache rouge' was noticed, coming in crops and disappearing on pressure. This patient recovered. Tympanites was more or less marked in all the cases. These were declared by the attending

¹ D. H. Dougan, "Transactions of the American Climatological Association," 1886.

² *Loc. cit.*

³ "Transactions of the American Climatological Association," 1886, p. 194.

physician to conform to the type of case usually regarded as 'mountain fever.'

In describing the Rocky Mountain resorts we shall begin with those in the State of New Mexico.

NEW MEXICO

SANTA FÉ, a city in northern New Mexico, at an altitude of 7000 feet, has 5600 inhabitants. It is a good summer and winter station. The air is dry, free from fogs, and cloudy days are rare. There is 75 per cent. of possible sunshine. The mean temperature for 1900 was 50.5° F., with extremes of 7° F. and 89° F. There are from twelve to sixteen inches of rain yearly, and from March 15th to April 15th high winds are likely to occur, but they are of short duration. There are two fairly good hotels, with moderate rates, and, in addition, the **St. Vincent Sanatorium**. In the mountains near by there are good hunting and fishing.

LAS VEGAS (6418 feet) is situated in northern New Mexico. It has a stimulating, dry, mountain climate. The mean annual temperature is low, and the relative humidity about 45 per cent. Rain-fall varies from 16 to 20 inches yearly. The town was built by the Mexicans, and has a population of 3552. EAST LAS VEGAS is a town of 2500 inhabitants, and has good schools and churches and a small hospital. While subject to dust-storms in winter, Las Vegas is, nevertheless, a suitable climate for many cases of **phthisis** throughout the year.

The LAS VEGAS HOT SPRINGS are seven miles distant, in a sheltered spot. The waters contain moderate quantities of sodium chlorid and sulphate. The Montezuma is an excellent hotel, and is probably the best place for the patient with means. There is a large sanatorium conducted on the hotel and cottage plan. The mud-baths are useful in the treatment of **rheumatism**.

ALBUQUERQUE (5200 feet), in the north-central part of New Mexico, has a population of 6238. There are fair accommodations for visitors. The fine hotel was destroyed by fire in 1899. House-keeping is expensive, inasmuch as most articles of food must be brought long distances. The chief attraction is the dry, rare air.

Fogs are infrequent. The mean annual temperature is 56.8° F. From 5 to 7 inches of rain fall annually. Agriculture is entirely dependent on irrigation. Patients may remain at Albuquerque throughout the year.

SOCORRO, 125 miles south of Albuquerque, at an altitude of 4600 feet, has a population of 1512. It is a neglected village with no accommodations for invalids, but with unusual fitness for a health resort, and worthy of more attention than it has received. The mean annual temperature is 58.4° F. The extremes in 1900 were 8° F. and 104° F. The total rainfall for 1900 was 7 inches. There were thirty-one rainy days.

SILVER CITY (5800 feet), located on a branch of the Santa Fé Railroad and ten hours from El Paso, has a population of 2735. During winter and spring it is an excellent station for the tuberculous. Situated on sandy soil near pine forests on the surrounding mountains, there are camps and every opportunity for outdoor life. It is not too hot during the summer, but visitors may readily go to higher altitudes for a change if desired. There are four hotels and a Roman Catholic Hospital. Near Tryon is SKYUKA (3200 feet), on the mountain side. It has one well-kept hotel.

HUDSON HOT SPRINGS, near Silver City, has an altitude of about 5000 feet. There is a sanatorium where good care and attention may be had and where patients may remain throughout the year.

DEMING, a small town at an altitude of 4327 feet, has a population of 1341. The country is attractive, and one can remain throughout the year. There is a fair hotel where good meals are obtainable. The total rainfall in 1900 was 7.41 inches.

FORT BAYARD (6400 feet) was formerly a United States army post. It is nine miles northeast of Silver City. The mean annual temperature in 1900 was 56.4° F.; the mean for January is 41° F., and for July, 74° F. The rainfall is about 12 inches annually. A sanatorium for consumptive soldiers was established in 1899. There are brick barracks and officers' quarters. The present equipment is for 300 (see page 322). FORT STANTON (6000 feet), twelve miles from Lincoln, is the seat of the sanatorium of the U. S. Marine Hospital Service. It provides for tuberculous sailors of the merchant fleet and has accommodations for about 200.

ROSWELL, at an altitude of 3570 feet, has a population of 2000. The winters are delightful, but the summers are hot. The mean temperature for 1900 was 59.5° F. The extremes were 7° F. and 103° F. The rainfall was 19.8 inches. There is a **sanatorium** for consumptives. The hotels are inferior, but there are some good boarding-houses. The drives near Roswell are beautiful. EDDY, at an altitude of 4000 feet, possesses a good hotel. ALAMOGORDO, eighty-six miles from El Paso, Texas, lies at an altitude of 4400 feet. The summers are too hot for invalids. There is a small, first-class hotel. CLOUDCROFT (6000 feet) is a summer resort in the Sacramento Mountains, fourteen miles from Alamogordo. There is a mountain railway that offers many attractions to the visitor.

LAS CRUCES, in the fertile Mesilla valley, in southern New Mexico, has an elevation of 3800 feet. It is reached by the Atchison, Topeka, and Santa Fé Railroad. It has a very mild winter climate and few sudden changes. The air is very dry, and the temperature may range from 2° F. in winter, its lowest record, to 106° F. in summer, its maximum. There are, as a rule, no high winds. The winter is the preferable season, as the summers are very hot. In January it may be too hot at midday for long walks, but in the evening a heavy overcoat will be required, and at night, heavy blankets. It is necessary to come provided for cold weather, and flannels should be worn all the time. Las Cruces is one of the choicest winter stations in New Mexico. There is one very inferior hotel. The Alameda, three miles out of town, offers good accommodations.

COLORADO

This State has attracted more attention as a health resort than any other State in the Union. Its great reputation is well deserved. Its surface varies in elevation from 4000 to 6000 feet on the prairie plains, from 6000 to 7000 feet at the foot-hills and adjoining valleys, and from 7000 to 10,000 feet in the natural parks and mining camps in the mountains. The highest elevation is Pike's Peak, 14,134 feet. There are 130 mountain peaks above 13,500 feet in altitude. The climate of Colorado is characterized by low

atmospheric pressure, due to its elevation ; dryness of air, especially in winter and autumn ; a clear atmosphere, free from fogs and clouds, and consequently abundant sunshine ; marked diathermance of the atmosphere, producing a great difference in the sun and shade temperatures and between the temperatures of day and night ; comparatively little rainfall ; moderate breezes in summer and sometimes blizzards in winter, with snow as late as March. There are, at times, rapid changes of temperature from day to day. There is considerable atmospheric electricity. It is a bracing, healthful climate, inviting to out-of-door life. It is unfavorable to the development of tuberculosis, and is favorable to chest expansion and the increase of red blood-cells. Attention has been directed to Colorado chiefly as a resort for the prevention and cure of **pulmonary tuberculosis**, and for such patients, as for those suffering with pulmonary disease of almost any nature, it is an ideal region for the open-air treatment. The general indications and counterindications for high altitudes, as discussed in Part I of this work (Book I, pp. 61 *et seq.*), apply to Colorado resorts. Especially should those of nervous and irritable constitution, and those with weak hearts, avoid this region. Its great advantage for those of suitable constitution is that they may find large and prosperous settlements, or districts sparsely settled yet affording opportunities for profitable employment, in which they may reside permanently and thus retain the health regained.

Acute nephritis is not common in Colorado, but is exceptionally severe when it occurs. Chronic parenchymatous nephritis runs about the same course as in lower altitudes, but the interstitial form of chronic nephritis is said to be influenced favorably by the tonic, invigorating quality of the air. Renal tuberculosis is more frequent than elsewhere, owing to the large proportion of tuberculous subjects. Dr. Hill, of Denver, who has studied the subject, has not observed any influence from the climate. Slight, transient, circulatory albuminuria is frequent, particularly, it is said, in bicycle riders. The presence of smelters and the mining industries give rise to toxic albuminurias. The albuminuria of pyelitis appears to be of more common occurrence than at sea-level, due to the greater density of urine favoring precipitation of uratic and phosphatic

sediment and the formation of calculi. The false albuminuria of cystitis and urethritis is doubtless fully as frequent in Colorado as elsewhere. Stimulants are likely to produce more disturbance of the kidneys at high elevations than at sea-level. It has been found in Colorado that those who lead irregular lives, keep late hours, indulge in alcohol, and smoke a great deal at night have a more disturbed and less refreshing sleep than at sea-level; but this difference is not noticed in those who are acclimated and whose habits are regular. Sleep is disturbed more easily by slight causes, and in those who are overworked mentally, sleep is broken and likely to be of shorter duration. Neurologists in Denver say that the inherently nervous will have some difficulty in securing sufficient sleep, but less so if they avoid excessive physical exercise. This is especially true of neurasthenic and hysteric patients. Tuberculous subjects sleep as well in Colorado as at lower levels if they avoid overexercise and excesses. Nervous persons do not readily become acclimated, and may find it necessary to change their residence once or twice a year. On the whole, the climate of Colorado is excellent for overcoming *insomnia* and building up the nervous system in those who have suffered from *overwork* in the East at low levels, provided their digestion is good and that they do not have organic changes in the brain or blood-vessels. Dr. Walters and Dr. Solly have made comparisons of the results obtained in the treatment of tuberculosis under various conditions: In European sanatoriums,—Falkenstein, Görbersdorf, and Reiboldsgrün,—at altitudes of from 1375 to 2300 feet, an average of 51 per cent. were benefited; at Leysin, Davos, and Arosa, at elevations of from 4150 to 6000 feet, an average of 86 per cent. were benefited. At open resorts in lowland climates, including desert, inland, coast, and island climates, an average of 58 per cent. were benefited; while in the Alps and in Colorado, an average of 76 per cent. were benefited. These data are for patients in the first and second stages of pulmonary tuberculosis.

The so-called 'invalid belt' of Colorado varies in elevation from 4600 to 8000 feet, and extends from Middle and Estes Park to Colorado Springs. The best stations in this region are not neces-

sarily the cities. If dependent on some occupation only to be followed in a city, patients should seek suburban residences. Denver, long famous as a health resort, is now a great city, and among other drawbacks is subject to fumes of smelters bearing lead, arsenic, and sulphur. The dust and smoke hover about the city much longer than would be the case in a lower and more humid atmosphere. Cripple Creek, Pueblo, and other centers of industry are equally undesirable for patients having affections of the respiratory system. This opinion is freely expressed by the local physicians.

It has been stated that Colorado resorts have become infected by the numerous consumptives that have sought the State, with the alleged result that cases of tuberculosis originating there have become much more numerous. This is erroneous. That the proportion of deaths from tuberculosis developed in Colorado has been increased is true, but is explained by noting the fact that the total number of deaths from tuberculosis has been diminished. In Denver, in 1899, the total number of deaths from pulmonary tuberculosis was 439, and of these 9.9 per cent. are reported to have been cases originating in Colorado—about one-half the mortality reported for the previous three years, and less than any proportion that has been observed since 1893. Although Denver has gained about 25 per cent. in population during the last ten years, the number of cases specified in 1899 as having developed in Colorado is only four more than in 1893.

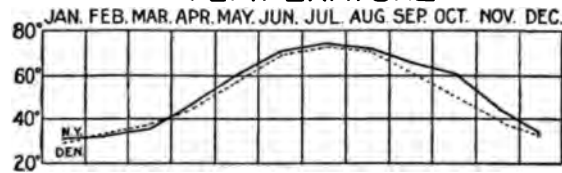
DENVER (5280 feet), in latitude 39° 45' north, very nearly on a line with Philadelphia, is probably the most noted health resort in America. It has a population of 134,000 (1900), and affords to the invalid not only a salubrious climate, but opportunities for self-support, educational facilities, and everything desirable for a permanent residence. The following diagram from Dexter¹ exhibits the temperature, pressure, relative humidity, and movement of the air at Denver in comparison with New York.

Denver has 42 per cent. of clear days to 27 per cent. for New York; the partly cloudy days are about equal; while New York has about double the number, or 31 per cent., of cloudy days. The

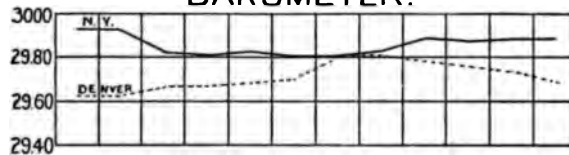
¹ "Philadelphia Medical Journal," December 1, 1900, p. 1067.

actual precipitation at New York is about three and one-half times that at Denver, which is given at $14\frac{1}{2}$ inches as the average of eighteen years. The average monthly movement of wind is about 2000 miles less at Denver than at New York, and over 100 miles

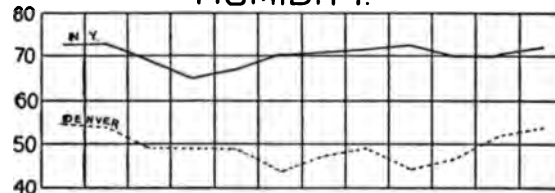
MONTHLY MEANS. TEMPERATURE



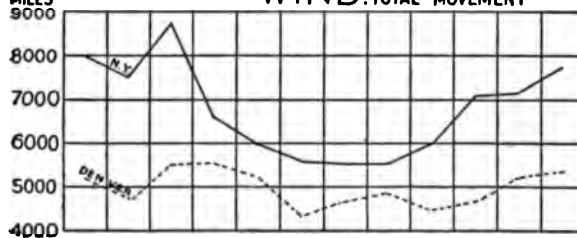
BAROMETER.



HUMIDITY.



WIND. TOTAL MOVEMENT



a day less than the average at Boston. Denver has a cool, stimulating climate and a dry air, in which polished steel may remain for years without rusting. In such an atmosphere the sensations of heat and cold are much less intense than at the seaboard. The soil is sandy and gravelly, and there are few surface streams.

Artesian wells supply good water anywhere. Dust and a dry soil go hand in hand all through the West, where vegetation is sparse.

As a result of public improvements and reform in the sanitary administration, the death-rate of Denver has been reduced from 19.4 as the average rate for 1000 in a year during six years, from 1886 to 1891, inclusive, to an average rate of 12.13 during the seven years ending 1899, or the still lower average of 11.18 during the last four years. In or near Denver there are a number of **sanatoriums** for the treatment of pulmonary tuberculosis, some private, some charitable. Just out of Denver is a sanatorium for tuberculous patients, established by the Protestant Episcopal Church, and called 'The Home.' It is well situated, with a fine view of the distant mountains and the city close at hand. Patients pay one dollar a day for board and room, and choose their own medical attendant from the city. At the 'Jewish Hospital for Consumptives,' restricted to patients in the early stage, treatment is free. The Rocky Mountain Industrial Sanatorium recently organized, with headquarters at Denver, aims to provide opportunities for self-support outside the large towns. It marks a decided advance in communal provision for those patients dependent upon their own exertions, and both desirous and able to work, and should receive the active support of physicians everywhere.¹

BOULDER, with a population of 6150, is in the heart of the Rocky Mountains, twenty-five miles northwest of Denver, and 5500 feet above sea-level. It is the seat of the Colorado State University. The scenery is inspiring, the air clear, bracing, and cool in the shade, even in the summer months. From October until March there are occasional high west winds, mainly dry and warm, and fogs are very rare. The accommodations for invalids are moderate. There is an excellent **sanatorium**.

COLORADO SPRINGS is situated seventy-five miles south of Denver, and 6000 feet above sea-level. This city of 21,000 inhabitants owes its prosperity chiefly to its climate and the fact that so large a proportion of its citizens have recovered health by taking up their

¹ Dr. A. H. Holmes, Jackson Block, Denver, is President of the Association, and the Advisory Board is composed of physicians and laymen of Colorado and other States.

residence there. It provides all that invalids require for either temporary or permanent residence. The city is on a prairie five miles from the foot-hills of the Rocky Mountains, and six miles from the base of Pike's Peak. The air is dry. The relative humidity for spring is 46 per cent.; for summer, 50 per cent.; for autumn, 54 per cent., and for winter, 50 per cent. The average rainfall is between 15 and 16 inches, about 4 inches of this amount falling between September and March. During March and April high winds are common, prevailing from about 11 A. M. until 3 P. M. on a majority of the days. From December 15, 1898, until May 1, 1899, there were 15 days with snow and wind-storms without dust, and 29 windy days in all. Of 135 days, 115 were fair. The climate is temperate yet varied; it is stimulating and not sedative. Colorado Springs has excellent hotels, clubs, a casino, library, a college, and two sanatoriums. The water-supply is from a pure mountain stream fed by the springs and melting snow from the sides of Pike's Peak. By means of irrigation, trees and gardens are well watered. Riding, cycling, golf, polo, and various sports are provided, and the social atmosphere of the community and general municipal régime are of a high order. The open-air treatment may be carried out in Colorado Springs under good medical supervision, the sunny days making it possible to spend five or six hours in the open air daily, or, better still, a continuous residence in a tent during the greater portion of the year. There is no saloon or public bar in the town, the sale of liquor being prohibited in the original title deeds to every plot of land in the corporate limits.

CAÑON CITY, situated south of Pike's Peak and west of Pueblo, at an altitude of 5363 feet, in a broad, fertile valley supposed to have been the bed of a prehistoric lake, has a population of 3775. There are no cañons, but mountains to the north, south, and west, five and ten miles distant, give the place a picturesque location in the midst of a natural amphitheater. The streets of the city are well shaded, and the sanitary condition is excellent. Malaria is unknown. There are hot mineral springs, and the waters are applied for the relief of rheumatism. The mean annual temperature is 53° F., and the precipitation 11 or 12 inches. The snow-fall was 14 inches in 1897, and 34 inches in 1898. It is, therefore,

warmer than Denver or Colorado Springs; the rainfall is slightly lower. The invalid will find few days, even in the coldest months, that he cannot spend out-of-doors with safety and comfort.

GLENWOOD (5600 feet), 160 miles west of Denver, lies in a protected valley in the midst of the foot-hills of the western slope of the Rocky Mountains. The annual rainfall, including snow, is 15 inches. The sheltered situation of Glenwood makes it an admirable winter resort. High winds are rare, and dust, so common on the eastern slope of the mountains, is absent. There are a large salt-water pool and fifty thermal mineral springs. A few of these, yielding about 2000 gallons of water a minute, are utilized. The temperature of the water is 127° F., and its solid contents, 1250 grains in a gallon. Carbonic acid gas and sulphureted hydrogen are given off in large amount. There are vapor caves in which the temperature of the air is maintained at 112° F. by the heat given off from the water. The internal use of the waters is combined with douches, massage, tub- and vapor-baths, and swimming pool, in treating the **gouty and rheumatic conditions, gastro-intestinal and hepatic catarrh, and torpor.** The waters favor recovery from **syphilis and diseases of the skin.** They are counter-indicated in organic disease of the kidneys complicated by degenerative changes in the arteries or by hypertrophy of the left ventricle, valvular lesions of the heart with poor compensation, or diseased blood-vessels, epilepsy, acute inflammatory diseases, recent hemiplegias, menorrhagia or metrorrhagia. Patients with compensated valvular lesions, unaccompanied by renal or vascular complications, suffer no inconvenience.

ESTES PARK is a beautiful little valley of about forty square miles in extent, northeast of Long's Peak, and 7500 feet above sea-level. It abounds in gentle slopes, winding trails through pine forests, and clear brooks from the neighboring mountains. There is an excellent hotel near the entrance of the park, overlooking the valley, where guests can find good saddle-horses for exploring the cañons and visiting the picturesque waterfalls. There is good trout-fishing near Elkhorn Lodge. From October to March the relative humidity varies from 38 to 49 per cent., and the rainfall amounts to six or seven inches. NORTH PARK, MIDDLE PARK, SOUTH PARK,

and SAN LUIS PARK are similar in many respects to Estes Park, but very much larger. They contain 2500, 3000, 2200, and 18,000 square miles respectively. They are beautiful inclosed valleys, sheltered by mountain ranges, and ideal places for camps during the warmer months, but not provided with establishments for the sick, and there is no adequate provision for medical attention. The altitude, from 7000 to 8000 feet, the pure air, the abundant sunshine and the dry soil, light rainfall, and opportunities for sport constitute the chief advantages of this region. While ranch life is suitable for young men with good digestion and fair endurance, the difficulty in obtaining good food properly cooked, and the fact that ranch houses are isolated and usually built without the slightest regard for sanitation, make it inadvisable unless all the conditions are exceptionally favorable. EGERIA, ANTELOPE, and MANITOU PARKS have some provision during the summer months for visitors.

SAN LUIS is in the extreme southern portion of Colorado, and surrounds a beautiful lake sixty miles in length. It was well populated by Mexicans less than one hundred years ago. In this park large trees grow 10,000 feet above the sea; cereals and vegetables thrive at 7000 feet, and potatoes at 8000 feet; pines and firs are of fair size at 11,500 feet. The climate is, therefore, exceptionally favorable, even at high altitudes.

IDAHO

This State, covering an area of 84,800 square miles, has a population of 84,000. Near Idaho City and near Boise City, the capital, there are hot springs. At WAHA there are ten mineral springs.

ARIZONA

Arizona possesses a typical warm, dry climate. Between May and October the heat is intense, and from April to June there is no rainfall. At Yuma the mean for July and August is over 90° F.; at Tucson it is 87° and 84° F. The Weather Bureau records 118° F. at Texas Hill and 115° F. and 116° F. at Casa Grande and Maricopa. Minima of 5° F. at Fort Apache and of —8° F. at Whipple Barracks, were recorded in 1897. The rainfall ranges

from 2 to 24 inches. The diurnal variation of temperature is great. Ice may form at high levels in the night, and at midday the mercury may rise to 109° F. Even the passage of the sun behind a cloud will cause the temperature to fall many degrees. Caution is therefore needed in regard to underclothing. In the higher altitudes blankets are always required at night. Flannels are worn the year around. The humidity is slight and comes chiefly from the Pacific Ocean across southern California, or from the Gulf of California across Mexico. The absence of moisture has a marked influence upon the bodily functions. There is no sensible perspiration. The skin becomes hard and the hair crispy. Cystitis is not unusual, and some persons will urinate only once or twice a day. The kidneys and bladder become irritated, owing to concentration of urine, and constipation is obstinate. There is a general tendency to loss of body-weight; the mouth, nose, and fauces become dry and give rise to follicular pharyngitis, tonsillitis, and chronic rhinitis. The liver is commonly inactive. In Arizona and New Mexico heat radiates rapidly. The low country is, for the most part, without foliage or vegetation of any kind, if we except the scrubby mesquit. Willow and cottonwood are found where irrigation has been introduced. From May until October no ill effects are felt from sleeping out-of-doors. The effect of the climate is usually to discourage exercise. In southern Arizona particularly there is little inducement for out-of-door employment in the case of those who go merely for health. Walking is very unpleasant on account of alkali dust.

There are three topographic and climatic regions in Arizona, all of them capable of therapeutic utilization, but as yet, for the most part, lacking in facilities for the care of delicate or fastidious persons. The **plain** includes about one-third of the Territory, lying to the south and west, below the level of 3000 feet, and especially what is known as the desert region, where the rainfall is only from 2 to 6 inches in a year. Along the rivers there is rich alluvial soil capable of cultivation, and when irrigated the whole region will be productive. The summers are intensely hot; the winters mild, sunny, and favorable for invalids who need protection. **YUMA** and **PHOENIX** represent well this region. The **pro-plateau** has an elevation of from 3000 to 5000 feet, and across the center of the Ter-

ritory a mean width of somewhat less than 100 miles. It widens at the cañon of the Gila to cover the whole southwestern corner. Its rainfall averages 10 inches. There are in this region a number of small towns and more or less primitive settlements (TOMBSTONE, HUACHUCA, CRITTENDEN, CALABESAS, NOGALES, and others), beautifully situated and enjoying mild winter climates, to which those capable of roughing it, and not requiring constant medical supervision, might be sent. The plateau, above the 5000-foot line, which combines many desirable climatic features, is suitable for residence throughout the year. PRESCOTT and FLAGSTAFF are its best-known resorts. It occupies more than one-half the Territory, and receives the major portion of the rainfall (11 to 20 inches). There are here two large groups of mountain masses, rising from 7000 to 9000 feet, and culminating in three peaks, Humphrey, Agassiz, and Humboldt, of which the first two have an elevation of nearly 13,000 feet (Glassford). Over these masses the rainfall exceeds 25 inches, but accurate measurements are lacking.

There are two rainy seasons in Arizona. The summer rains begin with the disappearance of the snow from the mountain summits in July, and continuing through August and September, fade gradually into the winter rains, which are most marked from December to February. Considerable variation is shown in the amount and local and seasonal distribution of rain from year to year.

YUMA (140 feet), with a population of 1800, lies in latitude $32^{\circ} 45'$ north, longitude $114^{\circ} 36'$ west, at the junction of the Gila and Colorado Rivers, the western bank of the latter belonging to California. The Mexican border is but a few miles, and the Gulf of California some sixty miles, to the south. The summer temperature is not bearable by invalids. It averages for the season 89° F. In 1899 there was a maximum of 112° F., and 152 days with a record of 90° F. or over. The winters are mild and sunny, the average temperature for the five months, November to March, being about 59° F. The average annual relative humidity is 46 per cent. The average absolute humidity is 3.19 as compared with 1.84 for Colorado Springs, and 5.42 for Cairo, Egypt (Solly). The hourly wind movement is 5.6 miles. In 1899 there were 301 clear days, and

only $\frac{6}{10}$ inch of rain, of which $\frac{5}{10}$ inch fell in November. The average annual rainfall, however, is given as 2.9 inches. Cases similar to those that do well in Egypt would doubtless benefit by a winter sojourn at Yuma, if the place were properly equipped for the care of invalids. The accommodations at present are not to be commended for the delicate.

AGUA CALIENTE, 100 miles east of Yuma, in the Gila valley, is a hot mineral spring with a local reputation for the cure of **rheumatism**, **neuralgia**, and syphilitic and other chronic **cutaneous eruptions**. No analysis of the water has been made.

PHOENIX¹ (1080 feet), the capital of Arizona, having a population of about 10,000, lies in the Salt River valley, 226 miles northeast of Yuma. The elevations in this valley range from 1000 to 3000 feet; there is no fog, and during the winter the temperature rarely reaches the freezing-point. In 1897 the lowest temperature was 34° F., and the highest 103° F. The sensible temperature ranges from six to eighteen degrees lower, and the summer heat is not unbearable, although from May to October temperatures of from 100° F. to 114° F. in the shade are recorded. The total precipitation is under ten inches. The percentage of sunshine is 84 for the year. The humidity is higher in the morning, reaching 81 per cent. in November, and the afternoon record is as low as 15 per cent. in April. The climate is favorable for the treatment of **phthisis**, **bronchitis**, **asthma**, and **nervous disease** of milder types. Accommodations are fair. There are three hotels and several boarding-houses. Patients should not remain during the summer.

CASTLE CREEK HOT SPRINGS, in the southern part of Yavapai County, twenty-four miles from Hot Springs Junction, and sixty-seven miles northwest of Phoenix, on the Santa Fé, Prescott and Phoenix Railroad, have an elevation of 2300 feet. They lie at the

¹Care should be observed in sending young men to the towns of Arizona, as there is great temptation to drinking, gambling, and other forms of dissipation. While this is by no means limited to Arizona, we have knowledge that there special laxity in these matters does exist, and some caution should be exercised in the absence of local restraining influences. Alcohol always acts more promptly in extremely dry regions, and small quantities produce effects for which much larger quantities would be required in a moist climate.

base of the high Bradshaw Mountains, in a sheltered position, amid beautiful scenery, not far from Crater Cañon, Buck Horn Cañon, and Old Fort. Access is by stage in four hours from the railroad. The temperature maxima for the months from November to April are from 62° to 86° F.; the minima, never below 36° F. In these months in 1898-99 there were 158 clear days, 17 cloudy, and 3 on which rain fell. Fogs are unknown. The open pool affords comfortable bathing all through the year. The waters contain forty-three grains of solid constituents in a gallon, chiefly sodium sulphate, sodium chlorid, and calcium bicarbonate, and have a natural temperature of 115° F. They are used with benefit in the treatment of **rheumatism**. Accommodations are excellent.

TUCSON (2400 feet), a beautiful old Mexican town, 250 miles east of Yuma, is favorably known as a winter resort. The low relative humidity during the winter,—42 per cent.,—the mild winter weather,—average temperature 57° F.,—the fine roads and scenery, attract many visitors. Cases of **tuberculosis**, **neuralgia**, and **rheumatism** do remarkably well, but it is impossible for invalids to remain after May 1st. The soil is of disintegrated granite, and the drainage is good. The rainfall occurs chiefly in August and September, and the total for the year is six or seven inches. Dust-storms are not unusual in winter. There are fairly good hotels and boarding-houses. The population is 7500. ORACLE, forty miles from Tucson, is a popular resort, at an altitude of 4600 feet.

PRESCOTT (5456 feet), 190 miles northwest of Tucson, has an excellent climate, cooler than Phoenix and other localities in the Salt River valley. Patients may remain all the year. The winter mornings are frosty, and the midday is warm, with occasional rain. March is the only disagreeable month. The rainy season occurs during July and August, but usually there are not more than one or two showers a week. From September until February the climate is particularly fine and the air dry. Prescott has a population of 3500, good schools, and a hospital. The mountain scenery and Walnut Grove Lake, a picturesque sheet of water not far distant, are among the attractions. Accommodations are fair.

Other resorts in Arizona that may be mentioned, are FLAGSTAFF (6800 feet), amid pine forests on the San Francisco plateau, 150

miles northeast of Prescott; SULPHUR SPRING VALLEY, and FORT GRANT (4200 feet). The Grand Cañon of the Rio Grande is about sixty miles from Flagstaff.

WYOMING

THE YELLOWSTONE PARK

Yellowstone National Park (7000 to 8000 feet), in northwestern Wyoming, is a wonderful tract of about 3000 square miles, extending into Idaho and Montana. It is of more interest to the able-bodied tourist than to the invalid, but is frequently visited by the latter. The park is under the protection of the United States Government. All game is strictly preserved, and the natural beauties of the region are made accessible. Railroads are excluded, and the visitor relies on an excellent service of stages that make a six days' circuit of the park. The best and most convenient entrance is by way of Cinnabar, on the Northern Pacific Railroad, or by Monida or Beaver Cañon, on the Oregon Short Line of the Union Pacific Railway. The season lasts from June 15th to September 15th. Comfortable hotels and camps are found at convenient points in the park. There are over 2000 mineral springs in the park. Many of these are thermal. The FOUNTAIN GEYSER, an alkaline saline water, is used therapeutically.

At LE ROY, on the Northern Pacific Railroad, there are springs of purgative waters. The PLATTE SPRINGS, near Fort Steele, are sulphureted thermal waters having a temperature of 115° F.

INDIAN TERRITORY AND OKLAHOMA

Indian Territory has an area of 64,000 square miles and a population of over 180,000. Its surface and soil are similar to those of Texas. **Oklahoma** has an area of almost 40,000 square miles and a population of over 61,000.

Neither Indian Territory nor Oklahoma possesses stations available as health resorts, but they afford opportunities for roughing it in the open air amid primitive surroundings and crude social conditions.

MONTANA

The State of Montana has an area of 146,000 square miles and a population of over 132,000. At Havre the mean temperature for January is 9° F. ; for July, 67° F. The mean annual precipitation is 14.1 inches.

GALLATIN VALLEY is a region of great fertility, dependent on irrigation, but with an unlimited supply of water from the mountains. There are three large green valleys through which flow three fine streams. The Montana Experiment Station at Bozeman, under the direction of Professor S. M. Emery, has done much to advance the agricultural interests of the region. The farms of the Bitter Root Valley are from 1000 to 2000 feet lower than the Gallatin Valley, which has a general elevation of about 4500 feet. BITTER ROOT VALLEY, a fertile region in southern Montana, has a cool, dry climate, and great diurnal and annual ranges of temperature. The climate is moderate in summer, but severe in winter, and there are no accommodations for invalids ; it is suitable for camping and hunting trips for the more robust.

LAKE McDONALD, in the Montana Rockies, near Bolton Station, is fed by mountain glaciers and is full of attractions to the tourist and hunter. The accommodations are primitive, and visitors usually go into camp. HELENA, an important mining center, has a natatorium 300 by 100 feet, inclosed, and supplied by the hot springs. PONY, in southern Montana, on a branch seventeen miles from the main line of the Northern Pacific Railroad, is one of the best locations in Montana for the treatment of tuberculosis.

UTAH

Utah has an area of almost 85,000 square miles and a population of 207,000. The mean temperature at Salt Lake City for January is 28° F. ; for July, 76° F. There are 16.2 inches of precipitation annually.

SALT LAKE CITY (4348 feet) has a population of over 53,000, and enjoys a cool, dry climate, with a large amount of sunshine, and an absence of high winds. It has an efficient sanitary system, and ex-

cellent waterworks. Bathing facilities at the **Salt Lake Hot Springs Sanatorium** include sulphur and salt baths. The water contains about 300 grains of solid ingredients in a gallon. This is two-thirds sodium chlorid. It is also charged with sulphureted hydrogen. The temperature of the water in the baths is 110° F. There are good accommodations at Salt Lake City, and visitors are always interested in the famous Mormon Temple. Great Salt Lake (4200 feet) is ninety miles long by from twenty to twenty-five miles wide, and has an average depth of twelve feet. It lies in the 'Great Basin,' an arid region, comprising several smaller basins, with lakes and tributary rivers having no outlet. The Great Salt Lake is the residuum of a great inland sea. There is evidence of well-marked shore lines on the surrounding mountain slopes, 1000 feet above the present level. The water is a dense brine, containing 22 per cent. of solid contents, about ten times as much as ordinary sea-water, and nearly as much as that of the Dead Sea, as shown in the following comparative list :

IN ONE UNITED STATES GALLON	GRAINS
Sea-water,	2,138
Mono Lake, California,	2,915
Castalian Mineral Spring, California,	4,422
Owens Lake, California,	7,000
Salt Lake, Utah,	11,000
Dead Sea, Palestine,	13,488
St. Clair Springs, Michigan,	17,704
Mt. Clemens Springs, Michigan,	13,364
Byron Surprise Spring, California,	18,773

BECK'S HOT SULPHUR SPRINGS, with muriated and sulphated saline waters, having a temperature of 128° F., are in the city limits. They are diuretic and cathartic, and used externally for the treatment of **metallic poisoning, tertiary syphilis, obstinate rheumatism, gout, and skin affections.** UTAH HOT SPRINGS, in Box Elder County, are reached *via* Ogden. They are at an elevation of 4246 feet, and are carbonated muriated saline. They are used for the treatment of **rheumatism, gout, syphilis, chronic bronchial catarrh, obstructive jaundice,** and other diseases. CASTILLA HOT SPRINGS (4920 feet) are sixty miles west of Salt Lake City. The waters are used externally. The climate is bracing.

NEVADA

This State has an area of 110,700 square miles and a population of over 45,000. At Winnemucca the mean temperature for January is 28° F.; for July, 72° F. There are 8.5 inches of precipitation.

LAKE TAHOE, the chief resort in Nevada, lies on the boundary-line between Nevada and California, at an elevation of 6220 feet. It is hemmed in by mountains, for the lake occupies the crater of an extinct volcano; the bordering mountains rise to an additional height of from 2000 to 4000 feet. The lake measures twenty-three by fourteen miles, and in places it is 2000 feet deep. The waters are exceedingly clear; the scenery is sublime. It is reached *via* Truckee, on the Ogden route of the Southern Pacific Railway. In the vicinity of Lake Tahoe the principal stations are TAHOE CITY, MCKINNEY'S, TALLAC, BIJOU, HOBART, and GLENBROOK. These are reached by steamer. DEER PARK INN, ten miles from Truckee, in the Bear Valley, is a comfortable mountain retreat accommodating about 100 persons, and has an attractive situation. These places are available only in summer, and are especially suitable for those who are benefited by high altitudes, a stimulating climate, and who enjoy the sports and rougher life of the Sierras. **Neurasthenics, hypochondriacs**, and those who need a profound stimulus and change of scene will find varied diversions and an unusual charm in the natural attractions of the region. INDEPENDENCE LAKE, WEBBER LAKE, DONNER LAKE, and CAMPBELL HOT SPRINGS are excellent places for camps.

CHAPTER XXVI

THE RESORTS OF THE UNITED STATES OF AMERICA. THE PACIFIC SLOPE. CALI- FORNIA, OREGON, AND WASHINGTON.

*The Pacific Coast of the United States. California. Oregon. Wash-
ington.*

THE PACIFIC COAST OF THE UNITED STATES

Those who are accustomed to the rapid gradation of temperature on the Atlantic seaboard of the United States do not always appreciate the totally different conditions present in the waters of the Pacific as they reach American shores. Puget Sound and the coast of Washington correspond in latitude to the gulf of the St. Lawrence or the shores of New Foundland, but the climate is vastly different. The Pacific seaboard has a moderate temperature ; it is not a region of extremes. The summers are cool, and the winters, as a rule, are mild, although periods of cold weather of very short duration may occur. The rainy season is usually from November to April ; the rainfall reaching a maximum at the northern limit and diminishing as we pass southward. Thus, Sitka, Alaska, has about 100 inches ;¹ the Tatoosh Islands, from 67 to 95 inches ; Olympia, Washington, from 33 to 56 inches ; Portland, Oregon, from 31 to 50 inches ; Roseburg, California, from 28 to 35 inches ; Red Bluff, from 28 to 32 inches ; San Francisco, from 24 to 37 inches ; Los Angeles, from 18 to 33 inches ; San Diego, from 10 to 16 inches. There is much variation from year to year.

CALIFORNIA

California presents a wonderful diversity of surface and corresponding varieties of climate. It has a coast-line of about 950 miles, which if transferred to the Atlantic, would reach from Boston,

¹ Abc

tl. of this amount falls during December, January, and February.

Massachusetts, to Savannah, Georgia. From the low levels of the coast, the ground ascends rapidly to the summits of the Coast Range of mountains. Beyond this range lie fertile valleys stretching for hundreds of miles, well watered and drained by the San Joaquin and Sacramento Rivers, and further to the eastward rises the magnificent Sierra Nevada Range, some of the peaks towering to a height of over 14,000 feet. Mount Whitney, in northern California, has an elevation of 14,886 feet. The mountain passes are from 6000 to 12,000 feet in altitude.

The grand divisions of northern and southern California are made with reference to the situation of the frontage of the land upon the Pacific Ocean and its relation to the great ocean currents; Point Conception being assumed as the dividing-line. The Kuro Siwo, or North Pacific current, in its course across the Pacific from Japan, strikes the California coast and divides, part going northward, sweeping by Washington, Vancouver Island, British Columbia, and Alaska, while the other portion, although at some distance from the shore, follows the trend of the coast southward. In doing so the shore south of San Francisco, and particularly below Point Conception, feels the warm influences of this stream much more than does the northern shore. The north shore of California is "more closely swept by the cold return current of the Kuro Siwo, is more directly under the strong sweep of the westerly trade- and the northwesterly countertrade-winds, having, as a consequence, a more sharply defined wet and dry season."¹ This cold current is inside the course of the Kuro Siwo and hugs the coast. Its temperature does not vary from about 52° to 54° F. the year round, and it brings with it from April to October cold north or northwest winds. This accounts for the cold damp air that characterizes the northern coast in contrast to that below Point Conception. The southern coast is more directly under the influence of the warm Japan current and is more free from the mists and dense clouds that are of almost daily occurrence in summer on the north shore.

The southern region is warm and equable. It faces more directly toward the south; it is bounded on the north by the curved line of

¹ J. P. Widney.

Sierra and Coast Mountains, and, contrary to the northern part, its mountain chains and valleys run easterly. The rainfall is lighter, but the atmosphere on the coast is more moist than in the north or in the foot-hills of the south. The tendency to the production of catarrhal affections is diminished. Throughout the coast belt the humidity is high at all seasons, and in summer fogs are liable to occur. The rainfall is higher than is the case inland at the same latitude. While more free from the penetrating winds called 'northers,' there is, on the other hand, a prevalence of cold ocean winds and what may be described as a perennially cool, yet equable, temperature.

The peninsula of **Lower California**—not to be confounded with southern California, as the southern portion of the State of California is called—belongs to Mexico. It is a barren, unsettled region, having a subtropic climate of little moisture.

We shall begin with the **Coast resorts of southern California**. This section includes the seven southern counties of the State—namely, Santa Barbara, Ventura, Los Angeles, Orange, and San Diego along the coast, and San Bernardino and Riverside interior to these. Their combined area is about equal to that of Pennsylvania; somewhat less, therefore, than that of England and Wales.

SAN DIEGO and **CORONADO BEACH** lie on the Pacific Ocean, in the extreme southwestern corner of California. The climate is warm and relatively dry, and especially attractive during winter. The average maximum temperature during January is 66° F., and the average minimum, 35° F.; in March the mean maximum is 74° F., and the mean minimum, 41° F. The mean maximum in July is 84° F., and the mean minimum, 56° F. Fogs are frequent during April and May, rolling in from the sea near nightfall and disappearing a few hours after sunrise, rarely continuing as late as 1 P. M. From April to October little rain falls, the total yearly precipitation averaging about 12 inches. At Coronado there is a modern, high-grade hotel with every comfort for guests, and an excellent **sana-torium**, under the charge of a physician well known as an author and editor. Sea-bathing is enjoyable almost throughout the year.

Through the courtesy of Mr. Ford A. Carpenter, Weather Bureau official at San Diego, we are able to furnish the following

table of comparative sea and air temperatures by months and decads, or successive periods of ten days each, from observations made during the year 1898, simultaneously at noon, local time :

DECAD.	WATER.	AIR.	DECAD.	SEA.	AIR.	DECAD.	SEA.	AIR.
Jan. 1st, . . .	55	58	Feb. 1st, . . .	58	59	Mch. 1st, . .	63	62
2d, . . .	57	54	2d, . . .	58	62	2d, . .	58	58
3d, . . .	56	55	3d, . . .	58	59	3d, . .	58	61
Mean mon.,	56	56	Mean mon.,	58	60	Mean mon.,	60	60
Apr. 1st, . .	62	60	May 1st, . . .	69	61	June 1st, . .	67	69
2d, . . .	67	64	2d, . . .	68	61	2d, . .	70	65
3d, . . .	68	65	3d, . . .	68	62	3d, . .	73	66
Mean mon.,	67	63	Mean mon.,	68	62	Mean mon.,	70	67
July 1st, . . .	74	68	Aug. 1st, . .	74	70	Sept. 1st, . .	73	73
2d, . . .	74	68	2d, . . .	77	75	2d, . .	74	74
3d, . . .	73	69	3d, . .	73	75	3d, . .	72	69
Mean mon.,	74	69	Mean mon.,	74	74	Mean mon.,	73	72
Oct. 1st, . . .	71	67	Nov. 1st, . .	62	68	Dec. 1st, . .	55	65
2d, . . .	66	66	2d, . .	62	67	2d, . .	54	58
3d, . . .	65	67	3d, . . .	57	62	3d, . .	54	63
Mean mon.,	67	67	Mean mon.,	61	66	Mean mon.,	54	62

The highest sea-water temperature during the year of observation was 78° F. on August 11th and 18th; the lowest, 53° F., December 12th. The highest noon temperature, 85° F., on September 9th; the lowest, 46° F. on January 10th.

The county of San Diego contains mountains over 11,000 feet in elevation. The Cuyamaca and San Jacinto Mountains afford deer hunting and desirable locations for camping parties. The city of San Diego is rapidly assuming considerable commercial importance. It has a fine harbor, affording safe anchorage for the largest vessels.

SANTA CATALINA ISLAND, twenty-eight miles from the mainland of southern California, is easily reached by rail from Los Angeles to San Pedro, and by a line of comfortable boats. The island is twenty miles long, and from a half a mile to nine miles wide. It affords a variety of altitudes, from sea-level to several thousand feet. The climate is equable, with considerable humidity, and fogs are not unusual at the lower levels. AVALON, the chief landing-place, has several hotels that in winter are full of visitors, attracted by the yachting, bathing, and excellent fishing. There are hundreds of

tents and excellent opportunities for leading an outdoor life throughout the winter. Avalon is shut in by high mountains that shelter it from ocean storms, and thus enjoys a protected marine climate, warm and sunny, and favorable for the treatment of **bronchitis, nephritis, and general debility.**

LOS ANGELES (300 feet), situated about fourteen miles from the Pacific Ocean, 345 miles southeast of San Francisco and 125 miles northward from San Diego, has a population of 103,000. There are two seasons—wet, in the winter, and dry, in the summer. During the dry season there is an occasional norther, due to high atmospheric pressure to the north, with a relative low area in southern California. Fogs are more frequent during the change of seasons. During the night and morning the winds are generally light land-breezes; in the afternoon they turn to fresh westerly sea-breezes. The relative humidity is 69 per cent.; the average number of clear and fair days is 316; of rainy days, 48. The best season to visit Los Angeles is from November to May.¹ From 10,000 to 20,000 tourists visit Los Angeles yearly, a large proportion for their health. The unfavorable experience of many of these, especially those in the later stages of **phthisis**, has prompted one of the physicians of Los Angeles to publish a warning in which the sanitary conditions of the city are unfavorably described. PASADENA is nine miles from Los Angeles, at an elevation of from 800 to 1000 feet. The soil is a sandy loam, a detritus from the mountains, about eight miles distant. The mean average temperature for January is 54° F.; for December, 58° F. From April to September fogs are quite frequent in the early morning, disappearing by eight or nine o'clock. There is much to interest the visitor, while the orange groves, the vineyards, the missions, the numerous cañons, the fine mountain scenery, and the excellent social and educational advantages make Pasadena one of the most attractive resorts in California. The winters are especially agreeable, the mercury rarely going below the freezing-point, and the large number of sunny days makes an out-of-door life inviting. Pasadena is known as the 'crown of the [San Gabriel] Valley.' In this valley, sheltered by the foot-hills of the Coast Range

¹ See Articles by S. A. Fisk, M.D., and Norman Bridge, M.D., "Transactions of the American Climatological Association," 1901.

on the north and by the Sierra Madre Mountains on the east, lie **MONROVIA** (400 feet), **DUARTE** (500 feet), **AZUSA** (600 feet), **SAN GABRIEL** (1000 feet), and **ALTADENA** (1500 feet). There are occasional fogs and dust-storms, with a hot and disagreeable wind; on the whole, however, it is a delightful region, and especially favorable for **consumptives** or persons with **renal** or **cardiac affections**. **MT. LOWE** (5650 feet), with **ECHO MOUNTAIN CHALET** (3500 feet), reached by cable and electric cars, and **MT. WILSON** (5400 feet), accessible by a good foot- and horse-trail, are attractive for climbing and camping.

SANTA MONICA is a popular seashore resort fifteen miles from Los Angeles, with good hotels, numerous boarding-houses, and a large natatorium where warm sea-water baths may be enjoyed at all seasons. **LONG BEACH** is a quiet resort with good sands.

SANTA BARBARA, a summer and winter resort northwest of Los Angeles, is protected on the north and has a southern exposure. There are roses in December and strawberries all the year. The average temperature at 2 P. M. in January is 63° F., and at 9 P. M. 52° F. In July the figures are 78° and 65° F. During the coldest weather wood-fires are needed morning and evening, but overcoats are rarely used except by invalids or when fogs occur. The latter are not unusual between May and September, but generally clear away by nine o'clock in the morning. The humidity is from 69 to 71 per cent. There is usually a gentle breeze from the ocean, beginning about ten o'clock in the morning and lasting until evening, when there is a calm, followed by a breeze from the mountains at night. Sudden gusts are infrequent. The rainfall is variable—as low as 4.5 inches for the year, or as high as 35 inches, averaging 18 inches. No rain falls, as a rule, between April and November, and seldom for twenty-four hours in succession at any season. Accommodations are unusually good. The town is supplied with water from the mountains. Many who spend the winters in Arizona and New Mexico find Santa Barbara an attractive summer resort. There are twenty hot sulphur springs of various temperatures. The climate is well suited for the relief of most cases of **pulmonary** and **bronchial disease** and **nephritis**. It is a safe and delightful refuge for old and young. The social advantages of this resort are unexcelled on the California coast.

REDLANDS (1350 feet), in San Bernardino County, is noted for its orange groves. It lies in a valley surrounded by mountains from 5000 to 10,000 feet high. It is hot and dry in summer, no rain falling for six or seven months. From November until April 1st there is a rainfall of about 12 inches. At night, even in the hottest months, one sleeps under blankets, although at midday the temperature may reach 110° F. The soil is red, deep, and porous, and susceptible of a high degree of cultivation. IDYLLWILD, in the Strawberry Valley in the San Jacinto Mountains in Riverside County, is the site of a sanatorium for tuberculous patients. The general elevation of this valley is 5200 feet; the latitude is 33° 48' north, and the longitude 116° 45' west. The property includes 1571 acres in the center of a government forest of 737,000 acres well timbered with pine, cedar, and live oak. The buildings consist of a central structure with well-equipped cottages and tents. The water-supply is from a mountain spring. Ground can be rented for camps, and guides, horses, tents, and all necessary accessories can be hired for short trips in the neighborhood. The growing prejudice against tuberculous patients in California, as well as in other States, makes the establishment of a sanatorium such as this particularly welcome. It is an ideal situation; on the east lies the Colorado desert, from which comes the nocturnal breeze; the Pacific Ocean is about sixty miles west. The scenery is remarkably fine. San Jacinto Mountain, twelve miles distant, rises to a height of 11,500 feet. The elevation of Idyllwild is the same as that of Davos Platz, but the former has a great advantage in the fact that out-of-door occupation is available 340 days in the year. The air is dry and pure and never unpleasantly hot in summer; occasionally in winter the temperature sinks below the freezing-point and has been known to reach 18° F. Access is by the Santa Fé railroad.

OJAI VALLEY, in Ventura County, about fifteen miles from the ocean, and from 900 to 1500 feet above tide, is reached *via* San Buenaventura and Nordhoff. It is one of the most beautiful spots in California, but at present lacks good accommodations. The soil is gravelly on the foot-hills and upper slopes, with more or less loam in the lower levels and bottoms. A mountain range

affords protection from sea-fog and winds. There are occasional high winds and sand-storms from the Mojave desert. The average yearly rainfall is 16 inches. The average winter temperature is from 40° F. to 70° F. The air is very dry. There are unusual opportunities for attractive horseback rides, for camping, and for shooting. Deer, quail, wild doves, and rabbits are plentiful. The region is suitable for cases of **phthisis**, **chronic bronchitis**, **chronic diarrhea**, and **nephritis**. Patients who have **asthma** at Santa Barbara are often relieved by going twenty-five miles distant to the higher altitude in the Ojai valley.

Northern California

While the more genial portion of the coast is below Point Conception, there is much to be said in favor of the resorts within easy reach of San Francisco. The winds that sweep through the Golden Gate and render the summer climate of San Francisco harsh, even chilly, are dispersed in all directions; to the Napa and the Sacramento valleys on the north and east; and southeasterly to the San Joaquin and Santa Clara valleys. The narrow and mountainous peninsula of San Mateo County, at the northern point of which stands the city of San Francisco, protects the bay, and, at its head, the San José (Santa Clara) valley. Here there is no afternoon gale in summer, but only gentle breezes. Naturally this valley is the home of many who have left the city. They have built there the finest country residences on the Pacific slope. There is nothing in the Eastern or Southern States to compare with the beauty of this region. The gardens are in almost perennial bloom. The roses, of wonderful size and richness, camellias, heliotrope, the wide-branching oaks, the flowering shrubs, the pomegranate, fig, eucalyptus, and cypress beautify the scene. No other great city has such environs. The main **Santa Clara Valley**, from fifteen to thirty miles wide, lies between the crest of the coast range and the summit of the Santa Cruz Mountains. Girdling its low foot-hills is a section known as the 'Warm Belt,' where frost is practically unknown. **SAN JOSÉ**, the county seat of Santa Clara County, is a wealthy town of 20,000 inhabitants. At **SANTA CLARA** (population 3000), about fifty miles

from San Francisco, is a college under the care of Jesuit Fathers. Three miles from Santa Clara is LOS GATOS, the center of an important fruit-growing district and an attractive health resort. MAYFIELD and PALO ALTO in this vicinity are likewise beautiful places. From San José it is thirty-four miles across the mountains to SANTA CRUZ. This beautiful resort has a southerly exposure on Monterey Bay. Mountains form its background; their sides and even their summits are covered with trees and shrubs, giving them a dark-green appearance as seen from the sea. Directly opposite Santa Cruz, twenty-six miles across the bay, and 125 miles from San Francisco, is MONTEREY, the ancient Spanish capital of California and a place of great beauty. Monterey has a sedative, equable climate, and outdoor life is pleasant throughout the year. The temperature seldom rises above 80° F., and although slight frosts may occur in winter, the midday is always warm. The temperature of the water is 52° F. in January and 60° F. in July. There are fine hotel accommodations, an excellent beach, good roads, and delightful views. It is suited for those who need rest, relaxation from business and other cares, or who have been exhausted by **chronic nervous** or **febrile diseases**. It is an excellent place for relief of **insomnia** and to build up the **neurasthenic**. It is not so well suited for the treatment of **tuberculosis** as more southern or inland stations. SANTA CRUZ and WATSONVILLE possess advantages similar to those obtained at Monterey. At SEASIDE there is a small **sanatorium**. Lick Observatory is at MT. HAMILTON (4444 feet), thirty miles from San José, and easily reached by a fine mountain road.

BERKELEY, on San Francisco Bay, is the seat of the University of California. ALAMEDA, at the 'Golden Gate,' and OAKLAND (population 75,000), nearby, are similarly situated. Many of those who do business in San Francisco reside in these attractive suburban towns. At Oakland the mean annual temperature is from 55° to 57° F.; the maximum was 103° F. in 1883, and the minimum 25° F. in the same year. The average daily range of temperature is from 11° to 13° F. The mean relative humidity for the year is 83 per cent. The rainfall varies from 11 to 38 inches. There have been noted from eight to thirty-seven foggy mornings in a year.

These places are, therefore, not to be chosen for health stations, although, on the whole, the climate is not unfavorable.

California is richer in **mineral springs**¹ than is any other State of the Union, east or west. Peale's list, which is incomplete, gives 325 localities. The waters are of all classes. Many of them are thermal, and numbers of them are bottled for shipment and sale.

NAPA SODA SPRINGS, on the southwestern slope of the Coast Range, at an altitude of 1000 feet, are six miles from Napa City, from which they are reached by stage. The springs are twenty-seven in number, with an average daily flow of 4000 gallons. They are alkaline chalybeate, and are valuable in **anemia, chlorosis, malarial cachexia, nephritis, and cystitis**. The waters have an extended sale throughout California, and the resort itself is one of the most delightful and salubrious watering-places on the Pacific coast.

GILROY HOT SPRINGS, in Santa Clara County, are nine miles northeast of the town of Gilroy, nestled among mountains and surrounded by fragrant forests of spruce and pine. The climate is of the genial character common to this region. The temperature of the waters varies from 108° F. to 115° F. They are gaseous alkaline earthy sulphureted, and are used with considerable benefit in **rheumatism, scrofula, and chronic affections of the skin**. **HARBIN HOT SULPHUR SPRINGS**, in Lake County (2000 feet), lie at the base of a spur of the Coast Range Mountains, seven and a half hours from San Francisco, by boat and stage. Lake County has been named 'the Switzerland of America.' The climate is invigorating, not subject to extremes of heat or cold, the mean temperature being 70° F. The region is picturesque, the surrounding slopes being clad with an evergreen forest. The waters are gaseous sulphureted saline chalybeate, useful in **anemia, chlorosis, malarial cachexia, and wasting diseases**. **HIGHLAND SPRINGS**, in the same county (1700 feet), is said to be an excellent resort for con-

¹ It is impossible even to enumerate all the springs in California. Full and trustworthy information can be found in Dr. Winslow Anderson's "Mineral Springs and Health Resorts of California," San Francisco, 1892.

sumptives. There are about twenty springs, five of the most important having been examined by Anderson. They are chiefly of the gaseous alkaline chalybeate type, thermal or subthermal. Artificially heated, the baths are employed in **rheumatism and joint affections.** Internally, they are said to be useful in **dyspepsia, neuralgia, and kidney and bladder troubles.** **CLEAR LAKE** (1700 feet), Lake County, is about 100 miles north of San Francisco. The lake, the many geysers, and various springs are reached by stage from Calistoga. The principal springs are the Indian Spring, Indian Mud Springs, Iron Spring, Alum Spring, Hot Alum Spring, and Acid Spring. The waters are employed medicinally.

HOT MUD SPRINGS, in Siskiyou County, are extensive hot mud beds and springs found on the banks of Shovel Creek. A small resort has sprung up at this place, and the baths are employed for **chronic rheumatism and joint affections.** **KLAMATH HOT SPRINGS** (2700 feet), in the same county, are on the Shasta division of the Southern Pacific Railroad, some eighteen miles from Ager, amid a wild and picturesque country, with snow-capped mountain peaks and coniferous woods. There are excellent accommodations and good bathing facilities. The waters are alkaline saline and sulphurous. Some of them are carbonated. The resort has considerable celebrity in California and adjacent States for the treatment of **chronic rheumatism and gout, articular affections, diseases of the skin, and dyspepsia.**

LAKE TAHOE (6200 feet) lies on the border-line between California and Nevada. It is twenty-one miles long, twelve miles wide, and averages 1645 feet in depth. **CARNELIAN HOT SPRINGS**, in Placer County, are situated on Carnelian Bay at the northern end of the lake. They are reached by stage in about two hours and a half from Truckee, over a good mountain road. The springs are about fifty in number—sulphurous, saline, and carbonated. The appointments are complete. All kinds of hot and cold sulphur baths are provided for the treatment of rheumatic and gouty disorders, and the waters are taken internally for affections of the **liver and kidneys, chronic constipation, and diseases of the skin.** The altitude and invigorating climate recommend the resort

in cases of bronchial and pulmonary affections. Camping, hunting, and fishing may be followed in the vicinity.

OREGON

Oregon has an area of over 95,000 square miles and a population of nearly 175,000. It is traversed by the Cascade Mountains, which rise in places to an altitude of 10,000 feet. The climate is mild.

PORTLAND (153 feet), situated in latitude $45^{\circ} 30'$ north, a city of over 90,000 inhabitants, is one of the principal seaports on the Pacific coast. The rainfall is about 43 or 44 inches; the mean annual temperature is 52.5° F. The maximum for 1897 was 95° F., and the minimum 22° F. The climate is a moist, sedative one, without sudden changes, and free from electric storms. Dr. H. W. Coe, a close observer of the weather in Portland, writes that winters are occasionally practically free from either snow or frost. He believes that the enforced moments of lessened activity dependent upon the changes of seasons give an opportunity for nervous recuperation. Nervous conditions associated with heart symptoms, functional or organic, are specially favored by the change.

The WILHOIT SPRINGS, in Clackamas County, are alkaline waters useful in chronic gastric catarrh and acute catarrhal nephritis. At AURORA, the Aurora Saline Springs are calcareous waters of doubtful utility. NEWPORT, in Lincoln County, has a summer school and is used as a sea-bathing resort, but the accommodations are crude.

WASHINGTON

The State of Washington is divided into two distinct regions by the Cascade Mountains. On the west, the Puget Sound country, there is really no winter and scarcely any ice or snow. The winters are warm and moist, and the summers cool and dry. Grass is green all the year round. These conditions are especially favorable for the growth of the famous pine forests of Oregon and Washington.

The coast of Washington is the most humid part of the United States. At Tatoosh Islands the relative humidity is about 90 per

cent., and the annual rainfall approaches 90 inches. In 1888 the mercury fell at Olympia, on Puget Sound, to -2° F. In 1897 it was only 10° F. The following table shows highest and lowest temperatures and rainfall at Seattle for the year ending December 31, 1898. Further north the rainfall decreases slightly, as a rule, though these figures are a fair average for all the country west of the Cascade Mountains:

MONTHS.	MAX. TEMPER- ATURE (IN DE- GREES FAHREN- HEIT).	MIN. TEMPER- ATURE (IN DE- GREES FAHREN- HEIT).	RAIN AND SNOW (PER CENT.).	MONTHS.	MAX. TEMPER- ATURE (IN DE- GREES FAHREN- HEIT).	MIN. TEMPER- ATURE (IN DE- GREES FAHREN- HEIT).	RAIN AND SNOW (PER CENT.).
January, . . .	51	27	1.99	July,	91	50	0.22
February, . . .	67	33	5.98	August, . . .	92	54	0.15
March,	60	29	1.39	September, . .	87	46	2.92
April,	78	32	1.51	October, . . .	66	36	4.69
May,	89	42	0.66	November, . .	56	31	3.52
June,	88	46	2.13	December, . .	58	27	4.12

Mean annual temperature of the twelve months, 52.2° F. Aggregate fall of rain and snow, 29.28 inches.

Western Washington possesses a climate in many respects similar to that of the south of England and the Channel Islands. Although above the latitude of Quebec and Montreal, roses bloom in TACOMA and SEATTLE in December. In eastern Washington the climate is very different, being much drier and somewhat colder in winter, and dry and considerably warmer in summer, but the summer nights are always comfortably cool. The climate of Washington, both east and west of the mountains, is free from sudden changes. There are no thunder-storms, cyclones, or blizzards. Western Washington is densely wooded; eastern Washington is prairie with light rainfall, and irrigation is employed. In eastern Washington there are very rarely high winds from the north and east. The warm southwesterly wind, called the chinook, brings rain in winter and early spring. There are, however, sudden changes of temperature and cool nights, but, owing to the low atmospheric humidity, little harm is done. In eastern Washington there are no mosquitos.

WALLA WALLA, a valley of remarkable fertility in southeastern Washington, has a rich lava soil, a gray volcanic ash, of unknown

depth, and is well watered and productive. There are enormous wheat-fields and orchards. The climate of Walla Walla is spoken of in the very highest terms by physicians who have practised there as particularly favorable to the treatment of **phthisis**. Living is inexpensive.

LAKE CHELAN, in central Washington, seventy miles long, lies amid inspiring scenery, the glaciers and snows of the Cascade Mountains. There are steamers on the lake, and two settlements at **CHELAN** and **LAKESIDE** can be reached by steamers on the Columbia River from Wenatchee. The climate is cool and stimulating, and agreeable to those who enjoy camp life. It is a wild and rugged country, and visitors should be prepared for roughing it.

MEDICAL LAKE, near Spokane Falls, has an extent of about 1000 acres and is encircled by low wooded hills. It is resorted to for the relief of **rheumatism** and **skin diseases**. The waters are said to contain sodium, potassium, lithium, calcium, magnesium, iron, aluminium, sulphur, and borax.

CHAPTER XXVII

TOWNS OF THE UNITED STATES¹

General Considerations. Boston. New York. Philadelphia. Washington. Chicago. St. Louis. New Orleans. San Francisco. University Towns.

Montreal, Toronto, and Halifax in Canada, and many of the larger towns of the United States, have been alluded to in preceding chapters. Others, representing certain geographical regions or individually important for various reasons, will now be described. As the cities of America are not so well known to the British or European reader as are the historic places of Great Britain and Europe to Americans, somewhat more of detail will be given than was necessary in the chapter on Towns of Europe. While nowhere in the United States can the artistic attractions of Paris or Dresden, or the historic and literary associations of Athens, Rome, or London be rivaled, yet it will be found in many cases that Europeans, familiar with the beauties and treasures of the old world, can not only find novelty in America, but that some portions of their holiday health tour may be spent in its towns with interest and benefit. The educational facilities, general and technical, are good in all the places mentioned, though naturally better in some than in others. Universities or colleges, museums, art galleries, libraries, medical schools and hospitals, are to be found in all; and each has some special sociologic, historic, or other quality well worth discriminating attention. Those in the Eastern, Southern, and Central States are liable to extreme heat in summer, and are very uncomfortable places during such hot waves as the one in progress as the proof of this page is revised for the press; but Europe seems to have suffered similarly.

¹ In the preparation of this chapter valuable assistance has been given by Dr. Walter L. of New York city.

MASSACHUSETTS

Boston is the principal seaport of New England, and has a population of 560,000. It is nearly surrounded by water, occupying a position on Boston Bay protected by low, outlying islands. The climate is cold and stimulant, conducive to intellectual and physical development. The mean annual temperature of Boston is 50.8° F., or 5° F. lower than that of Philadelphia. The extremes in 1899 were -4° F. and 94° F. The relative humidity at 8 A. M. and 8 P. M. was 71 per cent. and 67 per cent., the morning record being three points lower than that of Philadelphia. The precipitation in the year varies from 34 to 50 inches. The average hourly movement of wind is 10.9 miles in Boston, against 9.8 miles in Philadelphia and 8.7 miles in New Orleans. A maximum velocity of sixty miles an hour was recorded in November, 1898. The percentage of possible sunshine is 52. There are about 130 clear days and 144 cloudy days in the year, and from nine to twelve days of fog—less fog than in Philadelphia (16), New York (34), or Chicago (16).

The climate of Boston is of great variability; not so much because of the extremes of temperature, but that the frequent passage of areas of low pressure down the St. Lawrence valley exerts a disturbing effect on the New England climate generally. While situated on the coast, the climate is essentially continental. The weather conditions are brought to it from the West, and are, therefore, those of a great continent somewhat tempered by the coast. The winter climate is severe. During November, December, January, and February northwest winds prevail. In 1899 August was the only month recorded by the Weather Bureau in Boston in which easterly winds prevailed. The east winds of Boston are, therefore, not numerically frequent, but when they occur, make a decided impression, with the result that people, whether unjustly or not, associate Boston with a great deal of east wind. Charles Dudley Warner, speaking from experience, says: "A New Englander is a person who is always just about to be warm and comfortable. That is the stuff of which heroes and martyrs are made." At all events, New Englanders are well known as a hardy, long-lived race. Boston's nickname of 'The Hub' is, in a spirit of fun, still a genuine acknowledgment of its position as an educational, literary,

and intellectual center. The summer climate of Boston is such that all who are able to do so leave town for the various resorts on Cape Cod, the North Shore, and the coast and mountain resorts of New Hampshire and Maine.

Although Boston itself is not favorable for persons with tuberculosis, there are neighboring localities, such as NEWTON, SHARON, and WELLESLEY HILLS, where porosity of soil, abundance of pine woods, and a slight elevation (400 to 500 feet) above surrounding towns afford better conditions.

NEW YORK

NEW YORK city, the commercial metropolis of the Western hemisphere, and the most rapidly growing large city in the world, is at all times of the year the host of thousands of visitors from all countries, drawn thither as well for recreation or education as for the transaction of business. In extent, New York covers not only Manhattan Island and the borough of the Bronx on the mainland to the north of it,—the old city of New York,—but also much of the western end of Long Island (including Long Island City and Brooklyn, which last as a separate city ranked fourth in the United States in population), Staten Island, and smaller islands in the East River and in the harbor ;—all of which contain a cosmopolitan resident population of three and one-half millions. Large though this area is, it is steadily growing smaller relatively to the number of inhabitants, owing to the daily influx from smaller cities and from the country. This steady augmentation is quickly rendering the population of the outer limits of the city dense ; that of the central portions, denser. Accommodation for it has greatly altered the architecture of the city and the domestic life of its people ; for, while many reside in private houses, most New Yorkers now live in hotels—the number of which is probably unequaled, as their sumptuousness and equipment are unexcelled—or, more usually, occupy a floor or part of a floor in a tenement-, 'flat-', or apartment-house, built to supply homes for from ten to one hundred families.

This mode of living is interesting from a medical standpoint as well as in its social bearings. It complicates the tuberculosis problem. The solution of which, especially among the tenements

in the poorer quarters of the city, much has already been accomplished. On the other hand, it has removed some of the sources of functional, nervous, and other disorders in women, which were supplied by the cares of domestic management in a large house ; and its popularity with all classes is attested by the fact that many fine residences are being torn down to be replaced by finer 'apartments.' These, and the ever-increasing 'sky-scraping' office-buildings, have done much to improve the appearance of the city, which architecturally as well as scenically has made great progress within the last decad. The city driveways, especially, have been much improved. Of these, the most worthy of mention are the Speedway along the Harlem River ; the various drives leading into the Broadway Road, which runs from Spuyten Duyvil north along the Hudson River ; the Coney Island driveway and bicycle path in Brooklyn ; Riverside Drive, and the park roads.

Van Cortlandt, Bronx, and Riverside parks are largely uncultivated but very popular : Van Cortlandt because of its golf-links in summer, and its skating facilities in winter ; the Bronx for picnicking, rowing, flower-gathering, and, more recently, for zoologic study. Prospect Park in Brooklyn, and Central Park in Manhattan, are the largest cultivated parks in the city, and the latter especially is a model in landscape gardening. It is $2\frac{1}{2}$ miles long by about $\frac{5}{8}$ of a mile wide, and being situated in the heart of the city is available for walking exercise for invalids. Its fine driveways, equestrian path, and picturesque shaded walks make it attractive to adults, while it is, at the same time, the most-used playground for children. One large and several smaller lakes permit rowing and ice-skating in appropriate seasons, while the large city reservoir enhances the beauty of the upper part of the park, in which it is located. The Museums of Art and of Natural History (the latter just outside of the park proper), the menagerie, the botanical garden, and the meteorologic observatory add to the educational features of Central Park. Various parts of its extensive lawns are set aside for tennis, baseball, foot-ball, croquet, and other games ; and small children are afforded here a variety of amusements. Two restaurants are located along the east drive of the park, and from another pavilion mineral waters are served to those who seek them

in the course of a constitutional before breakfast. In summer one of the Nathan Straus depots for the distribution of uncooked, sterilized, and modified milk is located just within one of the park entrances.

New York is a noisy city. Those who desire accessibility to its activities and a quiet home to which to retreat for rest should seek one of the numerous and pretty suburbs to be found in New Jersey, on Long Island, or in New York State along the Hudson River or Long Island Sound. They are all readily reached by train, and many of them also by water route. Numerous excursions are afforded along the interesting East River and the Sound, on the majestic Hudson, or through the beautiful New York Bay and the other waterways of a harbor probably unsurpassed in the world. Those needing mental distraction can find it in the cosmopolitan activity of this lively metropolis—in the whirl of social pleasures, in theater-going, in sight-seeing, or in quiet study in the universities, libraries, museums, art galleries, and musical conservatories. Valuable adjuncts in the treatment of those seeking diversion in New York, because of worry or other nervous condition, are afforded by the private and public hospitals, 'homes,' and hydropathic, electric, and gymnastic institutes.

New York is situated in 41° north latitude, 74° longitude west from Greenwich. Its temperature range is wide (from -6° F. to 99° F., with a mean of 52.6° F. in 1899), subject to extremes, especially to extreme heat in summer, and often to sudden changes. Owing to its insular and seaboard position the extreme summer heat of 'torrid waves' is usually a few degrees less in New York than the average of sister cities. Its climate is moist, the relative humidity in 1899 averaging 76 at 8 A. M. and 73 at 8 P. M. In the same year the rainfall was 42 inches, but in other years it has often exceeded 52 inches. The average hourly movement of wind varied from 8.6 miles in July to 18.9 miles in March. The prevailing direction of wind is northwest. In 1899 there were 29 thunderstorms, 128 clear days, 127 partly cloudy days, 110 cloudy days. Both in summer and in winter the temperature in New York is milder than that of Chicago and, compared with that city, its relative humidity is less (in spite of its seaboard situation), and there is less wind, but there are fewer clear days and more foggy

days. There is more sunshine in New York than in Boston, Chicago, St. Paul, or Portland, Oregon; but less than in Philadelphia, Baltimore, or Denver. The climate of New York, though stimulating, being moist, changeable, and in winter rather cool, is unfavorable for those subject to bronchial and laryngeal disorders, and to patients ill with, or convalescing from, pulmonary tuberculosis. In spite of this, New York is a healthy and, it may be said, a healthful city. Its water-supply, from Croton and Kensico Lakes, is of excellent quality and free from typhoid contamination. It has been amply demonstrated that the great mass of typhoid fever cases are infected outside of the city or from sources imported into it. The same may be said of malaria in recent years, although this class of affections formerly prevailed in Harlem and the East River districts; and the extensive digging up of the city now in progress for the construction of the rapid transit tunnel has not altered the morbidity statistics. Contagious diseases, developing at home or in school-houses, are watched by an active health board; and tropic diseases, such as cholera, typhus fever, etc., are almost unknown in New York. The city's annual mortality records for the last three years show an average of 67,503—a death-rate of 19.42 per thousand per annum. Of these, the average annual mortality from pulmonary and other forms of tuberculosis was 9491; from pneumonia, 9032.

PENNSYLVANIA

PHILADELPHIA, founded by William Penn, was the first capital of the United States. Its population is about 1,300,000. The old city is situated at the confluence of the Delaware and Schuylkill Rivers in latitude $40^{\circ} 57'$ north, nearly on a line with Madrid and Lisbon, and is about sixty miles from the sea in a direct line. The intervening portion of the State of New Jersey is almost a level plain, abounding in pine, oak, and other timber of second growth. To the westward, the land rises gradually, and the nearest mountain ridges are from fifty to one hundred miles distant. The highest elevation within the limits of Philadelphia is 450 feet. The mean annual temperature is 53° F., with extremes of -6° F. (1898) to 103° F. (1901). While the mean temperature for the year is about 5.7° F. higher than at London, the mean for January is 3° F.

lower, and for July 15° F. higher. The relative humidity at 8 A. M. and 8 P. M. is 75 per cent. and 68 per cent. The rainfall is about forty-three inches, nearly twice as great as that of London ($24\frac{84}{100}$ inches). London, however, exceeds Philadelphia, as well as New York, Boston, Chicago, and all the principal cities of the United States in the number of rainy days. There are about 129 clear days each year in Philadelphia, which is less than at Baltimore (141), at Denver (150), or at Phoenix, Arizona (259). The spring opens in Philadelphia two or three weeks earlier than at Boston, and autumn lasts longer. Roses may bloom through November. The winters are not generally severe. Comparatively little snow falls; yet there may be days or weeks of temperature below the freezing-point. Philadelphia has thirty-six parks, the largest, Fairmount Park, containing over 3000 acres, through which flows the Schuylkill River, spanned by four bridges. Within the limits of the Park the river varies in width from about one-fourth of a mile to one-half of a mile. At the northernmost boundary of the East Park, the romantic Wissahickon stream empties into the Schuylkill, and the beautiful paths along its borders are favorite resorts for driving, riding, cycling, and walking; while the tree-covered hills that rise just beyond are attractive places for picnics. There is excellent boating both on the Schuylkill and on the Wissahickon; and skating on river, creek, and lake in the winter. Throughout the Park at convenient locations are houses of rest, restaurants, dairies, playgrounds, and the like. The natural beauties of the grounds are preserved as far as possible. At the southeastern border of the West Park is the extensive Zoological Garden. The beautiful Horticultural Hall, and Memorial Hall with its art collections, are on rising ground, less than a mile distant.

Fairmount Park is of inestimable value to the citizens of Philadelphia, and doubtless exerts a controlling influence on the death-rate, particularly among children. The climate of the well-wooded park with its hills, its meadows, and its water, is quite different from that of crowded alleys, close rooms, and narrow streets. For those who are unable to travel, a large park offers a change of climate of no small importance.¹

editor frequently utilizes Fairmount Park for open-air treatment in cases of
1, and for graduated climbing exercises in cardiac cases, obesity, etc.

Besides parks, Philadelphia has been provided, through popular contributions, with a **sanatorium** principally for children at Red Bank, on the Delaware River, ten miles below the city, to which two steamers make hourly trips during the summer months. The admissions to the sanatorium in a single season have reached 128,000, of which 28,000 have been adults. While primarily intended for a day's excursion, there is a hospital department where patients and caretakers may be accommodated for a longer period. This single institution has, no doubt, contributed largely to the marked decrease in the death-rate among the children of the poor in Philadelphia in recent years. In addition, three charitable sanatoriums for children at Atlantic City are now (August, 1901) available.

Although Philadelphia is sixty miles from the ocean, salt water may be reached quickly ; the trip to Atlantic City is made by rail in sixty or seventy minutes, and that to Cape May in two hours or less. On a Sunday during the hot weather over 50,000 persons commonly make the excursion to the seashore and return. Thousands of those who do business in Philadelphia spend the summer nights at Atlantic City or other nearby seaside resort.

As a place of residence, Philadelphia is one of the most desirable cities in the United States. It possesses many historic buildings. Its libraries, museums, educational facilities, and public and private hospitals are of a high order. An Institute of Physiologic Therapeutics is about to be established under the best professional auspices ; and its facilities are to be at the service of all reputable physicians. The climate is a moderate one. The streets are well paved and generally clean ; there is an absence of the tenement-house evil, and families in very moderate circumstances can occupy well-built houses in pleasant neighborhoods at comparatively small cost. Hence it is often called the 'City of Homes.' It is said to resemble an English town more nearly than do other American cities. The suburbs are attractive, and the great extent of the city—129 square miles—affords rural life even within the corporate limits, as in the famous district of GERMANTOWN, the site of Pastorius's settlement. The walks, drives, and cycle paths in and around the outskirts of the city are beautiful and interesting.

DISTRICT OF COLUMBIA

WASHINGTON, the national capital, is second perhaps only to New York in its attractiveness to visitors. Added to the surpassing beauty of the new Congressional Library,¹ the valuable collections in the Smithsonian Institution, and the allied United States National Museum, the Corcoran Art Gallery, the Zoological Park, the workings of the Federal Government, the numerous buildings in which that work is conducted, the official and semi-official functions connected with the presence of the diplomatic corps—all are of great and distinctive interest.

Geographically, as well as socially, Washington possesses the characteristics of both Northern and Southern cities. It is 38° 53' north latitude, 77° west longitude from Greenwich; 35 miles southwest from Baltimore. It lies in the District of Columbia, 184 miles from the mouth of Chesapeake Bay, and occupies the north-east bank of the historic Potomac, between its Anacostia (eastern) branch and Rock Creek, which separates it from Georgetown. Beyond the city is a range of tree-covered hills, and Washington itself covers an undulating tract of nine and one-half square miles, having a mean altitude of 40 feet above the river, and rising in its highest point to 104 feet. The city is beautifully laid out. The Capitol building is the center about which it is built, the streets, running due north, south, east, and west, taking their numeration therefrom. They are well paved, graded, and lighted, and provided with numerous shade trees. These, about 100,000 in number, are a picturesque feature of the city. Twenty-one broad avenues cross the streets diagonally, forming, at the intersections, triangles which, as with the numerous 'squares' and 'circles,' are laid out in lawns ornamented with foliage, fountains, and statuary. The Mall extends west from the Capitol grounds, and in it are the Botanical Gardens and the Department of Agriculture buildings. The Park, stretching from the Mall to the Potomac, contains the Washington Monument. The Tiber runs through the city, but is built over and forms part of the excellent sewerage system. Plants for the filtration of the city water are under construction.

¹ The library of the Surgeon General's Office contains over 130,000 bound volumes, and secures, for reference, all medical books, monographs, and journals as they are published.

The mean temperature in Washington for the years 1895 to 1899 showed a variation of from 26.2° to 36° F. in February, to 70° to 79° F. in July; the relative humidity ranged between 60 to 65 in April, and 72 to 81 in August. The annual rainfall during the same period varied between 30 and 42 inches. As in most large cities of the Atlantic seaboard of the United States the combination of heat and humidity, varying but persisting for periods of days or weeks during the summer months (June to September inclusive), often becomes oppressive; and an escape to the country, the mountains, or the seashore is almost imperative during July and August.

ILLINOIS

CHICAGO (latitude 41° 53' north), situated on the west shore of Lake Michigan, near the head of the lake, has nearly 1,700,000 inhabitants, and has displaced Philadelphia as the second city of the United States in population. The elevation of Lake Michigan is 582 feet above tide. The adjacent territory is a nearly level prairie. Indeed there is no elevation above 1005 feet in the State of Illinois. The climate of Chicago is one of great extremes of temperature. The absolute annual range is from 101° F. to 119° F. A maximum of 103° F. has exceptionally been recorded (1901). The mean annual temperature is from 44.3° F. to 53° F. (7° C. to 11.5° C.). The rainfall varies from 22.41 inches (1867) to 47.1 inches (1858). The mean rainfall is 35 inches.

Chicago, commonly nicknamed in the United States, 'The Windy City,' has a total annual wind movement varying from 69,000 miles to 145,000 miles with an average hourly velocity of 16.9 miles, while in New York the velocity is 10, and in Boston 11 miles. In this respect Chicago exceeds even the exposed stations on Cape Hatteras and Block Island on the Atlantic coast. The mean relative humidity at 2 P. M. ranges from 61 per cent. in July and August to 74 per cent. in December. The records of early morning and evening humidity are from six to fifteen points higher. The climate of Chicago is modified by its position on Lake Michigan. This lake is never frozen entirely across, although in exceptional years ice sixteen inches thick has been cut as far as two or three miles from the shore. In August the water of the lake reaches

maximum temperature of 67.6° F. Chicago is in no sense a health resort, but, on the contrary, it has a rigorous and somewhat trying climate,¹ yet on the whole, cool and stimulating. The energy of its people is well known, and may be favored by meteorologic conditions.

The local disadvantages as to site, which in the city's early days negated the favorable climatic conditions general to the lake region, have been overcome and remedied; malaria has been practically eliminated; the diseases caused or aggravated by impure water are lessening under the influence of a better system of sewerage. The death-rate from pulmonary tuberculosis has also been greatly reduced. The use of soft coal for fuel by the extensive industries of Chicago is responsible for a dense cloud of smoke that, no doubt, aggravates, if it does not originate, many diseases of the air-passages. Chicago may fairly dispute with Pittsburg the title of the 'Smoky City.'

MISSOURI

St. Louis is situated on the Mississippi River, at latitude 38° 38' north, and has a population of nearly 580,000. The mean annual temperature is 56.6° F. The annual range is 118° F., with extremes of —16° F. in 1899 and 108° F. on July 24, 1901. In 1899 the rainfall was 34 inches, there was 65 per cent. of possible sunshine, and there were only four foggy days. The mean relative humidity at 8 A. M. was 76 per cent., and at 8 P. M., 62 per cent.

St. Louis is in the list of what are termed in the United States 'the Southern cities,' but it shares in the severity of winter equally with the cities of the North. It is liable to cold waves. In February, 1883, the temperature fell from over 60° F. to 10° F. in a single day, and in the cold wave of 1899, —16° F. was reached, the lowest ever recorded in that city.

St. Louis is a desirable place of residence excepting during the summer months, when the heat is excessive. The continuous high temperature of July, 1901, when for three weeks there was scarcely a day when 100° F. or over was not recorded, marks one of the notable hot waves on record. Tornadoes are not infrequent in

¹ See "The Climate of Chicago," by Professor H. A. Hazen, Bulletin No. 10, Weather Bureau, United States Department of Agriculture, 1893.

Missouri, and the most destructive tornado ever recorded in the United States was the one that occurred in St. Louis on May 27, 1896, in which 257 persons were killed and about 650 injured; the damage to property amounted to \$20,000,000. Fortunately, such catastrophes are rare, but the fact remains that the configuration of the surrounding country, essentially an extensive prairie, and the liability to atmospheric conditions of the same nature, are constant factors. All the middle western States are occasionally visited by storms of this character.

In general, the climate of St. Louis is that of moderate warmth and moisture, with sufficient variability to influence favorably commercial pursuits.

LOUISIANA

NEW ORLEANS, the greatest seaport on the gulf of Mexico, has a population of 287,000, and is situated on a low, alluvial plain 100 miles from the mouths of the Mississippi River. Its latitude is 29° 58' north, and the climate is warm, moist, and fairly designated as subtropic. The mean annual temperature is 68.8° F. (20° C.). The isothermal line passes through the north of Africa, Morocco, and Barbary, skirting the boundary of the desert of Sahara, and crosses Egypt in a line with the Isthmus of Suez. Only twice has the temperature been recorded in New Orleans at 100° F. In the winter of 1870 it fell to 16° F. During the cold wave of February 13, 1899, an unheard-of event occurred: ice an inch in thickness formed at the mouth of the Mississippi in East and Garden Island Bays, and the temperature fell to 10° F. On the 17th of February there was a flow of ice past New Orleans into the gulf of Mexico, a phenomenon never before witnessed. When snow falls in New Orleans, it is an occasion of great excitement. The frosts that accompany the 'norther,' or sudden cold waves accompanied by northerly winds, are of sufficient intensity to destroy the sugar-cane and cotton-plants, but do not always strip the trees of their leaves. There can hardly be said to be a perpetually verdant vegetation, for the distinction between winter and summer is pronounced.

The annual rainfall is from 31 to 56 inches, of which about half falls in the three summer months. There are more foggy days

than in New York or Boston ; there is much less wind, and about 62 per cent. of possible sunshine.

The climate, moderated by the Gulf of Mexico, is warm, moist, and somewhat enervating. The numberless bayous, lakes, swamps, and water-courses in the neighborhood of New Orleans are liable to great floods that threaten even the city itself. As a protection from inundation, levees have been constructed, and even with these precautions, breaks occur and much damage is wrought.

New Orleans is liable to epidemics of yellow fever and cholera. The city is built on such low ground that good drainage is well-nigh impossible, and by digging from three to four feet, water can usually be found. The majority of streets are unpaved ; there are few sewers, and the houses have no cellars. The Board of Health of New Orleans, by unusual vigilance in quarantine, has endeavored during the last twenty years to eliminate yellow fever from the mortality records. In 1878 over 4000 persons died of this disease in New Orleans, and there was scarcely a case until 1898, when there were seventy-four cases and nineteen deaths. In that year there were 2500 cases in Louisiana and Mississippi. Malaria is the scourge of the land. The mosquito has every facility for propagation, and the death-rate from paludal diseases is high. Typhoid fever is not a prominent cause of death.

CALIFORNIA

SAN FRANCISCO is the largest seaport on the Pacific coast. Its population in 1900 was somewhat less than 350,000. The climate is entirely different from that of any other city of the United States. It is harsh and trying, but not one of great extremes. On the contrary, the temperature never reaches 90° F., and on very rare occasions falls below the freezing-point. The annual mean is 48.8° F. The diurnal range in January is about 8° F. ; in July the range is 8.1° F. It is thus evident that a range of twenty degrees Fahrenheit covers the mean temperatures of January and July. People living in San Francisco, as a matter of fact, wear the same weight of clothing throughout the year. The air is damp ; the relative humidity at 8 A. M. is 86 per cent., and at 8 P. M., 71 per cent. The rainfall is small—9.31 inches in 1898. The average

hourly velocity of wind is 10.8 miles ; the highest velocity occurs from March to September, with a maximum of 44 miles an hour. There are about an equal number of clear and partly cloudy days, and only fifty days a year on which rain falls. On twenty-five days there is fog ; thunder-storms are unknown.

Every afternoon in summer a bracing cool breeze from the ocean sweeps inland as the heated air of the interior valleys and plains ascends. Wherever the mountain barriers are broken down to the sea-level, as is the case at San Francisco, a gateway is opened for this sea-breeze that surges toward the interior. The hotter the day in the interior, the stronger is the wind and the cooler the weather in San Francisco.

It is a well-recognized fact that these strong ocean-air currents are unfavorable for persons with **pulmonary or bronchial affections**; the resultant fogs and mists are serious disadvantages.

UNIVERSITY TOWNS OF THE UNITED STATES

Physicians must often advise concerning the place at which young people under their care are to be educated ; or in other cases, the presence of a school at a certain locality may determine the direction of a shorter or longer holiday. The following list, which is not exhaustive and does not include schools of medicine, law, theology, etc., except as they may be associated with universities, may be found helpful under such circumstances. Many colleges and universities are located in cities referred to on other pages. Thus, Columbia and New York Universities and Pratt Institute are in NEW YORK city ; the University of Chicago and Armour Institute of Technology in CHICAGO ; Johns Hopkins University and the Woman's College in BALTIMORE ; the University of Pennsylvania, the Central High School (which gives a collegiate course and grants collegiate degrees in arts and science), Drexel Institute, Pennsylvania Academy of the Fine Arts, Pennsylvania School of Industrial Art, the School of Design for Women, Spring Garden Institute, and Girard College in PHILADELPHIA ; Boston University and the Massachusetts Institute of Technology in BOSTON ; New Orleans and Tulane Universities in NEW ORLEANS ; ST. LOUIS an

CINCINNATI Universities in those cities ; Georgetown and Columbian Universities, and the recently inaugurated WASHINGTON Memorial Institute in the national capital ; and the Western Reserve University in CLEVELAND, Ohio.

A large number of remaining colleges are in towns and villages sharing the climatic conditions of nearby cities. The Northwestern University is in EVANSTON, twelve miles north of Chicago. HAVERFORD, BRYN MAWR, and SWARTHMORE, near Philadelphia (about twenty to thirty minutes by train), are pleasant and interesting localities primarily important because of the colleges of the same names located in them, and now becoming the site of elegant country residences of citizens of Philadelphia. Three large colleges are clustered near Boston. Harvard, the oldest and richest University in America, is in picturesque and historic CAMBRIDGE. Tufts College in MEDFORD, on the Mystic River, and WELLESLEY in the town of the same name, lie five and fifteen miles from Boston, respectively.

Bowdoin College is located on an elevated plain south of BRUNSWICK, four miles from the southern coast of **Maine**. The temperature here is not liable to violent alterations, but the winters are often severe. HANOVER, **New Hampshire**, the site of Dartmouth College, is a pleasant mountain village on the east bank of the Connecticut River, about sixty miles southwest of the White Mountains. Clark University is located in WORCESTER, **Massachusetts**, a lively manufacturing town forty miles from Boston, and built partly in a valley and partly on the slopes of surrounding hills. At WILLIAMSTOWN, already mentioned as an attractive summer resort in the northwestern part of Massachusetts, is Williams College. Near the center of Massachusetts, and within a short distance of one another, are three picturesque college towns. AMHERST, eighty-two miles from Boston, commands an extensive view of the Connecticut valley and of the adjacent mountain ranges. The (Amherst) college museums are of rare value, and the greenhouses of the Massachusetts Agricultural College, one mile from the town, add greatly to its beauty and its interest. NORTHAMPTON, on the Connecticut River, occupies elevated ground and affords a fine view of Mounts Tom and Holyoke. The grounds of Smith College

and the broad well-shaded streets are its intrinsic beauties. **SOUTH HADLEY**, in which is located Mt. Holyoke College, likewise enjoys views of the Connecticut valley and of the adjacent mountains. **PROVIDENCE, Rhode Island**, the seat of Brown University, rises 204 feet above tidewater on the east side of Providence River, but on the west side is more level. In the center of the city the river expands into a beautiful cove surrounded by a park. **NEW HAVEN, Connecticut**, 'the city of elms,' already mentioned, is built on a plain, surrounded by hills. The grounds of Yale University are extensive and picturesque. **MIDDLETOWN**, where Wesleyan University is located, lies 24 miles northeast of New Haven and on the Connecticut River.

ITHACA is one of the most beautiful towns in **New York State**. It occupies both a fine plain and a range of hill-slopes. It lies near Cayuga Lake and several beautiful cascades enhance the beauty of the city's fine scenic environment. Cornell University, here located, is endowed, in part, by a land-grant to the State from the federal government. **HAMILTON**, a small manufacturing town between Albany and Utica, contains Colgate University. The United States Military Academy, at **WEST POINT**, enjoys a Hudson River view of unparalleled beauty. It is built on rocky cliffs and mountain spurs. **POUGHKEEPSIE** lies on a table-land on the other side of, and 200 feet above, the Hudson. The extensive grounds of Vassar College are two miles outside of the city.

NEW BRUNSWICK, in **New Jersey**, where Rutgers College is situated, occupies, like Ithaca, both flat and sloping ground. **PRINCETON** is attractive for the location there of Princeton University, formerly known as the College of New Jersey; for its fine residences, and for its Revolutionary associations. **SOUTH BETHLEHEM**, the site of Lehigh University, is a manufacturing city healthfully located amid mountains in a rich mining district in eastern **Pennsylvania**. The Pennsylvania State Normal College is at **MANSFIELD**, a pleasant village in Tioga County, in an elevated region. At **CARLISLE**, attractively situated at a moderate height in the beautiful Cumberland valley of the same State, are Dickinson College and the Indian Training School. **ANNAPOLIS, Maryland**, the home of the United States Naval Academy, possesses an air of quiet and seclusion, and is beautifully located near Chesapeake Bay.

Of the Southern university towns, **LEXINGTON, Virginia** (Washington and Lee University), offers, perhaps, the finest mountain scenery. **WILLIAMSBURG**, in the same State (William and Mary College), and **RALEIGH, North Carolina** (Shaw University), have considerable altitude. The latter institution is for the education of negroes of both sexes. **ATHENS**, possessing the State University of **Georgia**, is located in the center of a large cotton-growing region.

LEXINGTON, Kentucky (Kentucky University), and **GREENCASTLE, Indiana** (De Pauw University), lie in fertile farming districts. Indiana University is at **BLOOMINGTON**, located on a ridge between forks of the White River. Oberlin College is in the village of **OBERLIN, Ohio**, 105 miles northeast of Columbus. **DELAWARE, Ohio** (Ohio Wesleyan University), and **ANN ARBOR, Michigan** (University of Michigan), possess mineral springs; five in number at Ann Arbor, where a water-cure has been established. This town is built on both sides of the Huron River and is thick with shade trees. **MADISON, Wisconsin**, the seat of the State University, lying in the midst of the 'Four Lake Region,' is one of the most beautiful cities in the West. **BLOOMINGTON, Illinois** (Illinois Wesleyan University), is a railroad and commercial center, while **LAKE FOREST** is a small town on the eastern border of the State, interesting chiefly because of the Lake Forest University. **DES MOINES, Iowa** (Drake University), is built, in its outskirts, on hills, and **IOWA CITY** (State University) lies on the highest of three plateaus, 150 feet above the Iowa River. Iowa College is at **GRINNELL**, fifty-five miles northeast of Des Moines. The State universities of **Minnesota** and **Missouri** are located at **MINNEAPOLIS** and **COLUMBIA**, respectively. **LAWRENCE**, the seat of the University of **Kansas**, occupies the banks of the Kansas River and is surrounded by timber lands. **BOULDER**, already referred to as possessing the University of **Colorado**, affords high altitude and bold, majestic scenery, being located near the Medicine Bow Mountains and the famous Boulder Cañon. The University of **California** is located at **BERKELEY**, across the bay from San Francisco. The Leland Stanford, Jr., University is at **PALO ALTO**, a town in the beautiful Santa Clara Valley, California, described in the preceding chapter.

CHAPTER XXVIII

THE REPUBLIC OF MEXICO

General Climatic Features. The Plateau of Anahuac. The City of Mexico. Zacatecas, Silao, Monterey, Saltillo, Durango, Vera Cruz.

General Climatic Features

Mexico lies between the Gulf of Mexico and the Pacific Ocean, and between Central America and the United States. At the border, the quarantine laws of the State of Texas and of the United States are strictly enforced, and travelers are at times liable to great inconvenience. Mexico is a republic of twenty-seven States and two territories, and covers 751,177 square miles. There are three distinct climatic and geographic zones. The **warm zone** comprises the low ground rising gradually from the sea to an elevation of 2500 feet. This is a region of heat, humidity, and unhealthfulness. It is important from a commercial standpoint, but not in any sense to be considered as desirable for a place of residence. Malarial diseases, yellow fever, dysentery, tuberculosis, and chlorosis are prevalent, and leprosy is not uncommon among the Indians. The **temperate zone** includes territory from 2500 to 5000 feet in altitude. Throughout this area malarial diseases are less common and of less severe type; but yellow fever, dysentery, and diarrhea are frequent causes of death. In the higher altitudes, or **cold zone**, comprising plateaus of from 5000 to 9000 feet in altitude, and mountain ranges of still higher elevations, are many stations attractive for residence and comparatively free from infectious diseases.

The great plateau of **Anahuac** occupies a central position, extending into New Mexico on the north, and following the Cordilleras southward. The descent is abrupt on the west, but it merges into gradual terraces toward the gulf. In this zone, somewhat south of the center of Mexico, at an elevation of 7400 feet, is situated the CITY OF MEXICO (latitude 19° 25' north), the chief city and capital of the republic. It lies in a depression in the plateau, rather

unfavorable for drainage, and during the rainy season exhibiting temporary marshes and bogs. The City of Mexico has a population of about 350,000. The mean annual temperature is 60° F. The coldest month is January, and the warmest is April. The mean annual rainfall is 23.75 inches. The rainy season is from May until October, and the most rainy month is August. January and February are less rainy, and March and April are comparatively dry. The prevailing winds are northerly. The mean annual (relative) humidity of air in the shade is 61 per cent., varying from 47 per cent. in April to 72 per cent. in September. Enteritis, colitis, and enterocolitis lead in the death-rate, producing 193 in 1000 deaths from all causes. Malaria and typhoid fever, with intermissions of a malarial type, are more common in the smaller towns near Mexico than in the capital itself. Typical typhoid fever is said to be rare. Typhus fever is common. Smallpox is prevalent among the Indians, and frequently assumes a virulent type. Vaccination is said to be greatly neglected. Rheumatic fever is common at the higher elevations. Tuberculosis causes 66 in 1000 of the deaths from all causes, and has been gradually declining since 1885.

The central plateau of Mexico is by nature well suited for the climatic treatment of **pulmonary tuberculosis**. Probably no region on the globe offers a better all-the-year-round climate. The elevation, sunshine, temperature, low humidity and precipitation, absence of snow, freedom from wind and dust-storms are distinct advantages, but "civilized man cannot live without cooks," and the want of the latter is the great disadvantage from the patient's viewpoint. At present it is difficult to obtain suitable food, and medical care is available at a few stations only. These drawbacks, however, are likely to be overcome in great degree in the course of years.

One of the best of the higher localities is ZACATECAS (8180 feet), capital of the State of that name, picturesquely situated at 22° 46' north latitude. This is a mining town with a population of about 50,000. It has a stimulating, tonic climate of great dryness. According to Dr. Liceaga (1890), there has never been registered a single death from pulmonary tuberculosis among the natives or among those habitually residing there. Dr. Breña and Dr. Torres corroborate this statement.

SILAO, 260 miles north of the city of Mexico, has an elevation of 5000 feet. It is reached *via* the Mexican Central Railroad. There is a **sanatorium** under good medical direction. COMAÑILLA, with hot springs, ten miles distant, is an excellent station for **diseases of the respiratory organs**.

MONTEREY (latitude $25^{\circ} 40'$ north), 170 miles from the Texan frontier, and 1700 feet above tide, is a city of about 60,000 inhabitants. It has good drives, and promenades, and good markets. Four American physicians reside there. Four miles distant are the TOPO CHICO hot springs. The baths have a temperature of 102° F. and an output of 68,000 gallons an hour. They are earthy sulphurous, and are applied for the treatment of **gout and rheumatism, syphilis, Bright's disease, hepatic and gastric disorders**. One of the springs contains arsenic. There is an excellent bath-house conducted by an American. As a winter resort Monterey is not so desirable as places further inland. The rainfall is excessive, and the mean annual temperature is 70° F.

SALTILLO (5500 feet), in the State of Columbia, 237 miles from the Texas border, lies at the foot of the Buena Vista table-lands, near the famous battle-field of that name, and has a population of 20,000. This city is said to have an equable climate; the mean annual temperature is 62.6° F.; the maximum, 96.5° F.; and the minimum, 32.8° F. The average relative humidity is 59 per cent.; the average rainfall, 22.67 inches; the average number of rainy days, 66 yearly. Its gardens are noteworthy, and it possesses warm springs that are used for the relief of **skin diseases and rheumatism**. The waters contain sulphur, iodine, bromine, and arsenic, but have not been properly developed. There are two hotels.

DURANGO (6200 to 6800 feet), a city of about 35,000 inhabitants, is beautifully situated on the plain of San Antonio, on the southeastern slope of the mountains. At latitude 24° north it lies on the same parallel with the southern part of the peninsula of lower California, and it is about 140 miles from the Pacific Ocean. The natural advantages of Durango are its warm, dry climate, attractive scenery, and perfect winter weather. From November to May not more than two inches of rain fall, but the rains of sum-

mer and early autumn bring up the yearly total to 21 or 22 inches. Irrigation is imperative for agriculture. It is an excellent place for the tuberculous, but, unfortunately, the prices charged at the only hotel in the town are extortionate. Durango has some warm springs that are utilized therapeutically. The temperature of the water is 94° F.

VERA CRUZ, having a population of 30,000, is an important port, situated at 19° 20' north latitude, on the Gulf of Mexico. The site is on a low, sandy beach, just a few feet above sea-level. The soil is very porous, but is marshy and partially submerged during the rainy season; there is no drainage, no sewerage, and a poor water-supply. The condition of the town is exceedingly unsanitary, and owing to the prevalence of yellow fever, menaces the United States. In 1899 there were 670 deaths from that disease in a total of 3583 deaths from all causes. Malarial cachexia and anasarca, due to chronic malarial poison, are frequently met with. There is also a form of fever resembling typhoid in many respects, but pursuing a shorter course, marked by great nervous prostration and ranking next to malarial disease as a cause of mortality.¹ TUXPAN, on the coast, north of Vera Cruz, and ALVARADO, south of the city, have the same unhealthful characteristics.²

TEHUANTEPEC has 12,000 inhabitants and is a town of great antiquity. Cholera, smallpox, beri-beri, and yellow fever have always been prominent causes of death. It is situated about twelve miles from the Pacific Ocean, and is naturally well drained.

SALINA CRUZ, the Pacific terminus of the Tehuantepec Railroad, is a small village between a lagoon and the sea. The danger to those not immune to yellow fever is great.

¹ Andrew Davidson, "Geographical Pathology," vol. II, New York, 1892.

² For further information on Mexican climate see "La Vie sur Hauts Plateaux," by A. L. Herrera and D. V. Lope, Mexico, 1899. "Eusayo de Geographia Médica y Climatología de la República Mexicana," por el Dr. Domingo Orvañanos, Mexico, 1889. "La Anoxihemia Barométrica; La Tuberculosis in las Altitudes," por el Dr. Daniel Vergara Lope, Mexico, 1893.

CHAPTER XXIX

THE HAWAIIAN ISLANDS

By **TITUS MUNSON COAN, A.M., M.D.**, of New York City

The Climate of Hawaii. Geography. Orography. Temperatures. Winds. Rainfall. Disease and Mortality. Resorts and Places of Residence. Therapeutic Indications.

THE CLIMATE OF HAWAII

Geography

The Hawaiian Islands are a group, or rather a chain, of islands commonly spoken of as twelve in number, of which seven are inhabited. They lie in the North Pacific Ocean, just below the tropic of Cancer, in the belt of the northeast trade-winds, between latitude $18^{\circ} 54'$ and $22^{\circ} 15'$ north, and between longitude $154^{\circ} 50'$ and $160^{\circ} 30'$ west of Greenwich. In the time order of their formation they extend from Kauai, on the northwest, the oldest island, to Hawaii, the newest, which gives its name to the group, along the segment of a large circle concave toward the southwest. "The chord of this segment, connecting the most widely separated points of the extreme islands, would have a course about north 60° west, and a length of about 400 miles" (Dutton).

The area, elevation, and population of the principal islands are as follows :

AREA, ELEVATION, AND POPULATION OF THE HAWAIIAN ISLANDS

(Government Survey, 1899 ; Census of 1896)

	SQUARE MILES.	HEIGHT IN FEET.	POPULATION.
Hawaii,	4,015	13,825	33,285
Maui,	728	10,032	17,726
Oahu,	600	4,030	40,205
Kauai,	544	4,800	15,228
Molokai,	261	4,958	2,307
Lanai,	135	3,400	105
Niihau,	97	800	164
Kahoolawe,	69	1,427	. .
	223		

The islands thus comprise an area of 6449 square miles, of which Hawaii, the largest, comprises nearly two-thirds, being nearly equal in area to the State of Connecticut.

These are the most isolated islands on the globe. The nearest coast, that of California, is 2200 miles away on the northeast; on the west and northwest, Yokohama, Manila, and Hong-Kong are 3400, 4890, and 4920 miles respectively; while to the southwest, Samoa is 2290 miles, and Tahiti 2440 miles from Honolulu.

Orography

The group is a chain of volcanic mountains, or rather of the summits of mountains, rising from the Pacific Ocean floor at a depth of about 18,000 feet, to a height of nearly 14,000 feet above sea-level. Coral-reef formations occur on parts of almost all the islands, but encircle none of them. The mountains of the island of Hawaii are domes of gentle slope; on the other islands of the group their acclivities are usually steeper. No other island mountains rival in elevation the domes of Mauna Kea and Mauna Loa. In Europe, only a few peaks of the Alps are higher. The summit of Mauna Kea commands a sea horizon of nearly 1000 miles in circumference, and from no other spot on the globe can so great an expanse of ocean be seen.

Mauna Loa, the second mountain in height, is but slightly lower than the twin dome of Mauna Kea. Its lateral crater, Kilauea, is a constantly active volcano; the summit crater, Mokuaweoweo, makes immense discharges of lava at intervals averaging about eight years. In no great period of geologic time this mountain may not improbably reach or surpass the height of its extinct rival.

These two great domes, with the lesser elevations of the Kohala Mountains to the north, and of Hualalai to the west, oppose themselves to the passage of the trade-winds from the northeast to the southwest. On the smaller islands, with lesser elevations, the obstruction to the trade-winds is less complete, but in either case the mountains are among the principal factors of the climate, as far, at least, as the winds, the rainfall, and atmospheric moisture are concerned.



U.S. GEOLOGICAL SURVEY

Annual Rainfall (inches)

J. B. Phillips

Temperatures

The Hawaiian has no word for 'weather.' For warm and cold, wet and dry, fair and rainy, and in general for the visible phenomena of the world he has a full nomenclature: but the generic word, a coinage of more variable climates than his own, he does not need. The Hawaiian climate, in a word, is the only tropic climate that is never oppressively hot. Its equability at comfortable temperatures and its absolute exemption from tornadoes and cyclones distinguish it from all other warm climates of which we have record, not only from Continental climates, like those of California and our southern States, but also from those of other islands; as from Jamaica and the Bermudas, with their great range of temperatures, from Samoa and Tahiti, with their excessive heat and liability to cyclones, and from the Sundas and the Philippines, with their terrible typhoons, where for half the year the mercury never goes as low as 80° F. Let us compare Teneriffe in the Canaries (latitude 28° 30' north) and Madeira (latitude 32° 40' north), the best of the Atlantic island climates. (See Book I, pp. 121 and 123.) In Teneriffe there are great equability and dryness; at Santa Cruz the January mean is 66° F., the July from 78° to 79° F.; at Orotava, the means for January and July are 61.6° and 76.6° F. respectively; but the country suffers from the *lesté*, or hot east and southeast winds from the Sahara; as does likewise Madeira, in spite of temperatures almost as equable as the Hawaiian. In Funchal the means are 64° F. in winter, 74° F. in summer, and 68° F. for the year, with the extremes of 60° F., and under the *harmattan*, or Sahara wind, of 90° F. at the upper end of the scale. At St. Anna the extremes of forty years are reported as from 60° to 80° F., but this range probably does not take account of the *harmattan* wind. While, therefore, these climates rival the Hawaiian in equability and outdo it in dryness, yet they cannot claim superiority on other points, and the same may be said of the Azores. (See Book I, p. 125.) At Fayal (latitude 38° north) the winter mean is about 58° F., that of July, 73° F.; of the year, 62° F., with a daily variation of seldom more than 6° F.; but in winter "the winds are violent and searching, and the houses are adapted only to those in rugged health" (Benjamin).

Throughout the Hawaiian group "the record of the thermometer is one of marvelous equability." At Honolulu the average daily range is 10° F.; in 1890 it was 11° F. for the year. The extremes of recorded temperature in the shade are 54° and 89° F. The minimum is reached at about 3 A.M., the maximum, at about 1 P.M. The monthly averages range from about 67° to 79° F.; for January, from 69° to 71° F.; for July and August, 78° and 79° F. The minimum of different winters ranges from 55° to 60° F.

The monthly and yearly averages at Honolulu are given in the following table :

MONTHLY AND YEARLY AVERAGES OF TEMPERATURE, IN DEGREES FAHRENHEIT, AT HONOLULU FROM 1883 TO 1900.

YEAR.	JAN.	FEB.	MAR.	APR.	MAY.	JUNE.	JULY.	AUG.	SEPT.	OCT.	NOV.	DEC.	AVERAGE.
1883, . .	70.84	70.96	71.37	74.92	75.96	76.74	76.76	78.58	77.00	76.87	73.36	71.21	74.547
1884, . .	69.94	70.21	71.89	71.12	73.03	77.15	77.42	78.08	77.86	76.41	73.66	60.62	73.866
1885, . .	69.17	71.24	. .	. . .	. . .	. . .	. . .	77.68	78.38	76.16	75.01	69.16	73.828
1886, . .	67.42	71.60	71.34	73.16	73.79	75.91	77.13	77.35	78.88	78.21	74.48	71.47	74.228
1887, . .	70.79	70.49	70.13	73.51	73.17	75.49	77.01	76.99	76.40	75.82	73.09	72.85	73.812
1888, . .	70.34	68.45	69.77	73.34	73.87	76.79	78.04	77.61	73.92	78.14	75.44	73.91	74.135
1889, . .	70.13	69.93	70.09	72.62	75.61	76.27	77.81	78.31	77.65	76.47	74.56	71.95	74.258

The yearly average temperature of the four years from 1890 to 1893 was 74.5° F.; of the three years, July, 1897, to June, 1900, 75° F.

What are the causes of this exceptional evenness of temperature in the Hawaiian group? The answer appears to be deducible from the data of Dr. Wyville Thompson's deep-sea soundings made in the 'Challenger' expedition. From these Dr. Carpenter deduced his theory of the movements of the cold and warm waters of the ocean; and this theory has been applied by Sereno Bishop to explain the Hawaiian ocean and air currents. The substance of Mr. Bishop's valuable monograph, with slight modifications, is as follows.

Visitors to Hawaii remark, in the island climate, two things that are new to their experience. The first is the extreme uniformity of air temperatures. While in all parts of the United States east of the Rocky Mountains cold and hot waves rapidly succeed one another, and the thermometer will one day be in the nineties, and the

next, perhaps, in the thirties, in Hawaii the breezes, day by day and month by month, are tempered with almost the same warmth: one day is little hotter or colder than another. The other peculiarity is the very moderate warmth of this island climate. Full tropic heat is almost unknown. The pith hat and the pugree of the real tropics are here uncalled for. The white man in Hawaii labors through the hottest seasons. One sees, without surprise, white carpenters and masons at work every day and all day throughout the month of August.

This combination of peculiarities is, I believe, unique. Other islands in tropic seas, like Tahiti or Jamaica, have great uniformity of temperature, but they melt in excessive heat. Others in cooler latitudes, like the Bermudas, while pleasant in the summer, are visited by occasional frosts in the winter. But Hawaii knows not the torrid heats of the West Indies or the South Seas, nor the broiling days and melting nights of an American summer. To what is this exemption due?

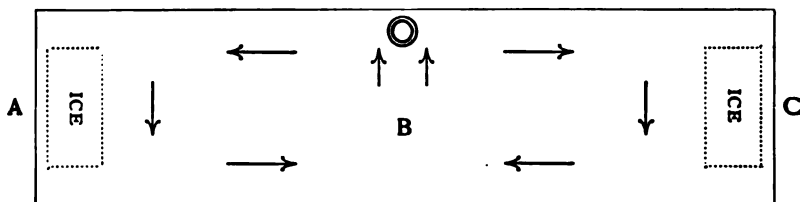
Islands in general owe their uniformity of climate to the tempering power of the wide ocean spaces upon the atmosphere. The air currents that reach Hawaii must pass over thousands of miles of sea of uniform temperature for several days. The ocean gives protection from arctic blasts, and equally from torrid siroccos. The same condition of a protecting ocean expanse occurs in the South Pacific. The trade-winds reach Tahiti and Samoa only after traversing an enormous breadth of ocean—from 5000 to 6000 miles. But within 2500 miles are the ice flotillas of the antarctic, chilling the sea, and bringing the air to 50° or 60° F. below the tropical temperature. This vicinity of cold to heat causes the hurricanes of the South Pacific, unknown to Hawaii. There, with the temperature of the water seldom far from 70° F., and the air but little warmer, with no Continental desert near, as in Australia, to mass the heat, and no arctic spaces to mass the cold—no cause exists for destructive tempests.

But why is the ocean temperature, from latitude 19° to 22° north, at so low an average as 70° F., and why, in the same latitudes, is it so much higher elsewhere? This is due in some measure to a strong surface current from the northeast, which brings uprooted

trees and saw-logs from the Columbia River, and is probably a return current from the Kuro-siwo, or Gulf Stream of the Pacific. But this is not a sufficient explanation, else we should find a similar coolness in the eastern part of every ocean within the tropics; as on the southeast coasts of Africa and Australia, where the return currents come directly from the antarctic ice-wall and its drifts of bergs. Why the difference?

Dr. Carpenter's theory explains the problem. Leaving out of account surface currents like the Gulf Stream and the equatorial current as having little effect in comparison with the movements of the vast ocean masses, it may be illustrated as follows:

Imagine a trough, A B C, filled with water at 60° F. In the



two ends of the trough, A and C, place blocks of ice. Through the surface of the center, B, pass a coil of pipe filled with steam. This arrangement will represent an ocean like the Atlantic, open from pole to pole; at each end are the ice masses; in the middle is the equatorial sun heat.

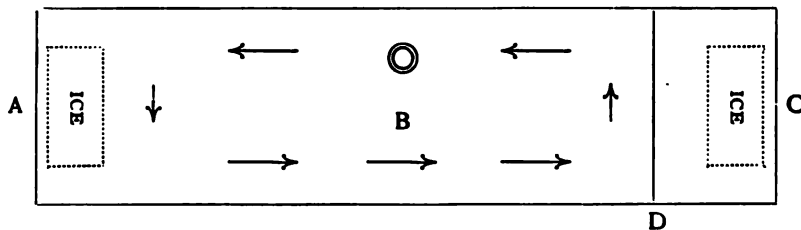
Now, what currents will be set up? The ice cools the water at the extremities to nearly 32° F.; the hot coil raises the surface water at the center toward the boiling-point. A rapid circulation is set up through the entire length and depth of the trough. The cold water at A and C sinks; the warm water at B flows along the surface to A and C, to take its place; and this movement pushes the cold water along the bottom, from A and from C toward B. There the two bottom currents meet, and push each other upward. At the surface the cold water meets the hot pipes, becomes heated, and returns along the surface to the extremities. Thus is established a continuous circulation in two circuits—of warm water from the center, on the surface, to each end, and of cold water, along the bottom, from each end to the center.

The deep-sea soundings of the 'Challenger' appear to show that the great mass movements of the Atlantic Ocean precisely correspond to this. In every part of the ocean below 1500 fathoms the water is at about 35° F. Above that depth the temperature slowly rises. Now, when we find ice water under the tropics, we conclude that it came there from the polar seas, for the earth-depths are hot, and the sea-depths should be warm, unless from a polar flow. This seems to be proved by this fact: the temperature of 35° F., to find which everywhere else outside of the polar circles you must descend 1500 fathoms, is found near the equator at only 500 fathoms below the surface. What does this mean? That two vast cold currents from the poles are meeting below and forcing each other up to the surface.

What, now, will be the effect of these currents on the clusters of islands in latitudes like those of Cuba and Tahiti? A vast set of water flowing from the equator, carries to them the tropic heats. The atmosphere of these regions will be surcharged with moisture, and we shall have the hot, damp climate of the West Indies and the South Sea Islands, which also have a warm current from the equator.

But why is it not the same with Hawaii? A single difference in the physical condition produces a very different result—namely, the closure of the Pacific Ocean on the north, at Bering Strait.

This appears in the following diagram, where at D a partition cuts off the ice at C from the rest of the trough :



What are the convective currents here? The partition prevents any cold current from C, the arctic end, and hence there can be no return current of warm water from B to C. The whole draft from the equator, B, is to the antarctic end, A. Nor does the cold water

pushed on from A meet any counterflow at B from the arctic, C, to compel it to ascend. Hence it flows northward until it meets the barrier, D. There, being compelled to find room above, it pushes up and flows back to B as a cool current on the surface.

Now, these seem to be precisely the conditions that distinguish the Pacific from the Atlantic currents. The Pacific is closed at the north by Alaska and Kamschatka, which closely approach each other, leaving only the narrow shoal of Bering Strait, which is of no account. In other words, while the Atlantic is open at both ends to the polar seas, the Pacific is open at only one end,—*i. e.*, to the antarctic ice,—and is cut off from the arctic. The 'Challenger' soundings show that under the equator in the Pacific the ice water is found **only** at the great depth of 1500 fathoms: it does not rise, as in the Atlantic, to within 500 fathoms of the surface. The vast mass of the equatorial waters flows southward, strikes the antarctic ice, and then, sinking, returns northward along the ocean depths throughout the entire length of the Pacific, a range of some 10,000 miles. It reaches the barrier of the Aleutian chain, in the extreme north; then it rises to the surface, an ice-cold current, turns and flows southward, gradually warmed by the sun, but still cool until it has reached the equator, and still moves on southward to the beginning of the circle. Thus the Hawaiian seas are replenished by cool waters from the north, while the South Pacific Islands receive the torrid heats of the line. The cool waters of the Continental glacier never reach them. They reach Hawaii, as we have seen, only after traversing the depths of the Pacific for two-fifths of the distance around the globe, and another fifth of the same distance as a surface current from the north.

But temperature, as has been shown in Part I of this work, should not be made the sole basis for the classification of climates. Under the captions of Winds and Rainfall we shall find in the Hawaiian Islands a diversity as remarkable as the uniformity of the temperatures just examined.

Winds

The prevailing winds are the northeast trades, at a temperature of about 70° F., and a saturation of about 65 per cent., but these

are greatly modified by the mountain masses. Professor C. J. Lyons, the accomplished observer in charge of the Hawaiian Weather Service, classifies the Hawaiian winds under five heads, as follows :

1. Trade-winds of the weather side exposure—the districts of Hamakua and North Hilo on Hawaii, Wailuku on Maui, and Koolau on Oahu. In these districts there are a considerable rainfall and a brilliant vegetation.

2. The lee-side trade-winds, as in Honolulu. The moisture is largely precipitated upon the mountains, but these are not high enough—from 3000 to 4000 feet—to keep the wind from sweeping over the ridges and through the deep valleys. By night there is a very gentle land-breeze. The trades bring little rain to Honolulu, and the southern slopes of Oahu are arid in comparison with those of the windward side. The winter storms from the southwest, however, make up the needed rainfall.

3. Strong trade-wind exposures—at the north and south capes of the islands, as northwest Kohala on Hawaii, Kaupo on Maui, and the south side of Molokai. Here the trades blow “uninterruptedly, drearily, endlessly.”

4. The region of alternating land- and sea-breeze—Hilo Bay and its neighborhood. To the north of Hilo Bay the trade-wind divides into two streams, one flowing westward, over Hamakua, the other southward, and very gently, often not reaching Hilo Bay until about noon. By night a well-marked land-breeze flows down from Mauna Kea, lowering the temperature ten or fifteen degrees. Stormy winds from the north occasionally arise, but in Hilo any strong wind is rare ; the southwest gales felt on the other islands are seldom known here. The north wind is the stormy wind : it brings heavy rains. “It is, no doubt, the incessant meeting of the warm vapor from seaward with cool masses of air from the mountain [Mauna Kea] that produces the world-renowned precipitation of Hilo—from 100 to 200 inches per year. An engineer told me he had known a sixteen-inch-deep sugar cooler to be filled in the open in one night” (Lyons).

5. The lee-side land- and sea-breeze district—the greater part of western Hawaii and of southern Maui. In these regions the sea-breeze comes in regularly at about 9 A. M., blowing inland ; and as

regularly, soon after nightfall, comes the land-breeze. From Kawaihae to northern Kona, or over the northern part of the coast first mentioned, the 'mumuku' also prevails—a violent downrush of trade-winds across the northern promontory of the island, abolishing all the local currents for the time being.

The trade-winds are regarded by the foreign residents as especially healthful. But a trade-wind winter is not a healthy season, being abnormal, "and sickness and mortality, especially among native Hawaiians, are greater than when the regular southerly wind is in due proportion. Much as has been said against the hated south wind, nothing affects the native worse than the north or northwesterly wind" (Lyons).

The 'Kona,' or southerly gales, usually begin in November—rainy, damp, and blustering winds, at a higher temperature and with higher saturation than those just described. For the foreign resident they are often enervating and depressing, yet the saturation for the months of their prevalence is not materially higher than at other times. The first heavy snows on Mauna Kea and Mauna Loa come in early November, and occasionally cover a full half of the height of the mountain, extending as far downward as to the 7000-foot level; the huge isolated dome of snow, rising in unobstructed splendor far above the tropic forests, is a spectacle of great sublimity. The top of Mauna Kea is almost exactly on the line of perpetual snow. The entire disappearance of the névé from the summits, as seen from below, is rare; and it is probable that the snow never entirely melts away. I have been on the summit of the mountain in July, and have seen large masses of frozen snow lying in the channels and wrinkles of the terminal cones, in spots where it could not be visible from the coast. But the question of its permanence could be settled only by establishing an observatory on the dome of the mountain; this could be built and maintained at no very great expense, and it would yield data of the highest value, especially in regard to the upper wind-currents.

The cumulus clouds are the trade-wind clouds; their lower limit in ordinary weather may be 2800 feet, their upper limit 8000 feet. Above this air stream a ceaseless current flows from the northwest, bearing the cirrus clouds, in secular and uninterrupted march, at a

height of from 10,000 to 25,000 feet. During the eruptions of Mauna Loa the column of mineral smoke rises perpendicularly perhaps 10,000 feet, and then rolls away to the northeast (Lyons).

The wind force and cloud amount at Honolulu for the three years from July, 1897, to June, 1900, are shown in the following table :

MARCH.	1897-1898.		1898-1899.		1899-1900.	
	WIND FORCE.	CLOUD AMOUNT.	WIND FORCE.	CLOUD AMOUNT.	WIND FORCE.	CLOUD AMOUNT.
July,	4.0	5.0	3.4	4.8	2.6	4.3
August,	3.0	4.0	2.9	5.0	3.3	4.5
September,	3.0	4.0	3.0	4.6	2.9	4.5
October,	3.0	5.0	3.0	4.8	2.9	5.5
November,	3.0	6.0	2.5	4.8	2.5	3.7
December,	3.0	5.0	2.1	4.5	1.3	4.0
January,	3.0	6.0	2.0	3.6	2.5	4.1
February,	1.4	5.2	2.1	4.9	2.3	3.6
March,	3.3	7.2	2.1	5.5	2.7	4.3
April,	2.6	3.9	2.5	4.7	2.7	4.8
May,	3.4	4.2	3.0	4.7	3.2	4.4
June,	2.5	5.2	3.3	3.7	2.0	3.1
Year,	2.9	5.1	2.9	4.6	2.7	4.2

Rainfall

Throughout the group this is very variable, whether at different stations or at the same station, and whether in the totals of the same month for different years or the totals of different years. It occurs under these forms : (1) Trade-wind rains, occurring at any time of the year ; (2) winter storms from the southwest, as already noted ; (3) spring rains of the month of April ; (4) July rains.

The trade-winds, laden with moisture from the North Pacific, blow during the greater part of the year, beginning with March ; in the South Pacific they blow during the same months. As already noted, the greater part of the moisture falls on the north and east acclivities of the mountains, from the sea-level to their highest ranges, giving a rainy climate to the windward coasts and uplands. But the precipitation is not confined to the windward side ; a part of it, especially on the smaller islands, spills over to the leeward side. Even on the island of Hawaii much of it falls on the west-

ward uplands, while very little rain gets to the westward coast itself; so that while Hilo, Hamakua, and Kohala districts, on the east, are deluged, the coasts of Puna, Kau, and western Kohala may be suffering from severe drought. It would be hard to find, in any part of the world, more striking contrasts in the amount of the rainfall of neighboring regions, or in their influviation. The eastward districts just named have a coast-line of about seventy-five miles, and not less than seventy perpetual streams: in the other districts, including the entire southeast and nearly all the west shores of the island, a coast-line of 200 miles, there is no running water—not a single stream reaches the sea, the light soil and the porous lavas absorbing the entire precipitation. There are few available figures for the coast rainfall of western Hawaii, but it is nearly *nil*. At high levels on the west side there may be heavy rainfall; yet even here the difference between the windward and the leeward stations is very great. Thus, at Kaumana, in the Hilo district, on the east, at an elevation of 1250 feet, the rainfall in the year from July, 1897, to June, 1898, reached the extraordinary figure of 230.99 inches, while at Waimea, partially sheltered by the Kohala range, but at an elevation of 2720 feet, the rainfall was only 34.64 inches. The direct distance between the two stations is forty miles. Again, at Olaa, near the east coast (elevation 1650 feet), and at Kailua, near the west coast (elevation 950 feet), the figures for the year 1896–97 were 176.82 and 51.21 inches respectively; and during the year 1899–1900, at Ookala in the Hilo district (elevation 400 feet), and at Pahala, in Puna (elevation 850 feet), the figures were 99.76 and 10.29 inches respectively. These stations are seventy miles apart.

Coming now to the smaller islands, we shall find that their lower mountain barriers allow a larger part of the trade-wind rains to reach the leeward coasts than is the case on Hawaii; and these, with rains from other sources, sometimes drench the entire island. Indeed, the yearly precipitation may be greater on the leeward than on the windward side; thus at Kahuku, on the north side of Oahu, the precipitation for the year 1896–97 was 22.16 inches, while at Punahou, on the south, it was 29.53 inches. In the year 1897–98 the figures were 24.64 inches and 25.03 inches, and in the year 1899–1900, 20.45 inches and 20.95 inches. Again, as on Hawaii,

so on a smaller island, the rainfall may be nearly extinguished at the leeward coast. Thus, on the east side of Maui, in the year 1898-99, at Kaupo, it was 80.87 inches while at Oluwalu plantation on the southwest (elevation 15 feet), it was but 3.70 inches; and here there was rain only from December to March. The rainfall for the year 1896-97 at other stations on Maui ranged from 17.36 inches at Kahului, to 39.05 inches at Puumalii; at eight stations on Oahu, from 16.44 inches at Kapiolani Park, near Honolulu, to 59.82 inches at Ahuimanu; and at four stations on Kauai, from 43.68 inches at Hanamaulu, to 76.93 inches at Hanalei. These totals, of course, include the winter rains and others not directly connected with the trade-winds.

The rainfall is thus in places phenomenally great, in other places almost absent; and it is very different at different altitudes. Often, too, the monthly and yearly averages vary greatly in the same place. Thus, at Honolulu, during the nine years from 1837-38, 1873-77, 1886-87, the annual fall varied from $21\frac{1}{10}$ inches in 1837 to $46\frac{8}{10}$ inches in 1838, and to $58\frac{4}{10}$ inches in 1887.

It will thus be seen that as to rainfall the islands have a great variety of climates. While some regions are almost rainless, others are deluged; and still others, like Honolulu, the chief place of resort, have a moderate rainfall only—the showers of an English April with the temperature of an Italian June. October is generally a pleasant month. The heaviest rainfall of the year occurs in November and February. December and January are variable months, fair weather sometimes prevailing throughout, sometimes heavy storms, sometimes rain from the north. March and April are marked by the rains that set in with the coming trades—on the northwest coast of Hawaii, as we have seen, these are very continuous and heavy, and more marked on Hawaii than on Oahu. With May the Hawaiians say ‘puka iwaho,’ come out into fair weather. When clouds hang over the sea and it is clear on the high mountains, they expect rain; and, conversely, fine weather when the mountains are clouded and there is clear space over the sea. June is a fine clear month, but with the vertical sun comes a somewhat higher midday heat and less wind, but the nights are cool. The July rains are trade-wind rains, and the natives call

them 'malama ino,' bad months, for canoe voyaging and channel trips (Lyons).

FROM RECORDS OF WEATHER BUREAU, HONOLULU, 1898-99

MONTH.	BAROMETER.		RELATIVE HUMIDITY.		ABSOLUTE HUMIDITY. AV. TO CUBIC FEET.	TEMPERATURE.			RAIN-FALL.
	9 A. M.	3 P. M.	9 A. M.	9 P. M.		MIN.	MAX.	AVERAGE.	
1898:									
July, . . .	30.007	29.950	66.0	72.9	7.07	71.7	82.2	76.6	1.63
August, . .	30.014	29.948	65.7	71.0	6.93	71.9	83.2	77.2	2.08
September, .	29.998	29.922	63.5	71.1	6.93	71.6	83.3	77.1	1.28
October, . .	30.022	29.935	69.3	73.0	7.14	71.5	81.7	76.2	2.16
November, .	29.993	29.908	67.1	71.5	6.71	70.7	79.7	74.9	1.64
December, .	29.997	29.886	70.4	81.3	6.28	64.7	77.7	70.6	2.03
1899:									
January, . .	30.030	29.935	67.4	80.8	6.17	63.4	78.0	70.4	1.22
February, . .	30.012	29.936	73.1	81.1	6.64	66.5	78.4	71.9	3.99
March, . . .	30.026	29.940	70.4	77.9	6.35	65.4	76.6	71.2	4.94
April, . . .	30.053	29.977	64.5	71.9	6.17	67.0	79.1	72.7	1.07
May, . . .	30.047	29.986	66.3	72.1	6.47	69.7	80.5	74.2	2.44
June, . . .	30.054	29.988	62.5	69.0	6.33	70.4	82.3	75.3	1.14
Year, . . .	30.019	29.943	67.2	74.5	6.80	68.7	80.2	74.0	25.62
July, . . .	30.002	29.944	66.2	68.9	6.80	71.5	84.2	77.0	0.42
August, . .	29.995	29.933	69.8	73.1	6.94	73.1	84.0	77.3	1.53
September, .	30.003	29.932	62.8	66.4	6.70	72.9	83.5	77.1	0.80
October, . .	30.010	29.929	67.2	72.0	6.86	71.4	81.4	75.7	4.02
November, .	30.053	29.960	68.9	72.3	6.27	69.0	79.5	73.6	0.67
December, .	29.968	29.870	68.4	79.3	6.44	65.9	79.8	72.2	1.75
1900:									
January, . .	30.040	29.944	64.0	73.4	5.76	64.6	77.2	70.4	0.74
February, . .	30.041	29.941	65.0	75.3	5.79	63.7	77.3	70.5	1.14
March, . . .	30.016	29.923	65.3	73.2	5.95	65.7	79.1	71.8	1.67
April, . . .	30.038	29.958	68.0	71.5	6.43	67.1	79.8	72.8	5.23
May, . . .	30.062	29.996	65.1	71.5	6.43	70.4	80.8	74.9	1.60
June, . . .	30.021	29.960	64.5	71.0	7.03	72.2	84.7	77.6	0.88
Year, . . .	30.021	29.941	66.2	72.3	6.45	69.0	80.9	74.2	20.45

An annual precipitation of 231 inches as at Kaumana, or, as it is said, of 274 inches at Kilauea (1890), has certainly its drawbacks on any theory. Kilauea has been recommended as a health resort, and doubtless, in view of the rainfall, a disciple of Priessnitz might commend it as a watering-place. Yet, a rainy climate is not neces-

sarily a damp climate. Nearly all the Hawaiian towns and villages are on or near the seacoast; but they stand for the most part on slopes of more or less gentle declivity, and this insures a rapid discharge of the heaviest rainfall into the stream channels or directly into the sea. "The Waikiki road was, one night, so far under water that the trams could not run, and boats could have been employed; yet in less than thirty-six hours the dust was blowing in the middle of the road. The soil is of porous coralline, through which the rain runs like a sieve" (Nottage).

The rapid discharge of the rainfall on the eastern coast of Hawaii is a sight to behold. I have stood upon the bank of a deep cañon in the Hilo district, while the heavy rain-pour was deluging the slopes of Mauna Kea. Far below, a pure mountain stream, easily fordable by leaping from one lava rock to another, was foaming seaward. Presently the noise of unloosed waters came from the mountain side, growing momentarily louder, and soon the torrent, yellow and turbid, came thundering down the rocky valley, with no less force and fury than if a great dam had broken in the mountains; and suddenly the little stream was magnified into a roaring and impassable torrent, a hundred times the volume of a few moments before. For days afterward, and for miles around, the sea would be discolored by the turbid discharge, and the floating driftwood came ashore at distant points along the coast.

Under high temperatures neither this rapid drainage nor the absorbent powers of the soil would prevent the overloading of the air with moisture. But, as we have seen, there is no excessive heat,—and without excessive heat, excessive dampness is unusual. What constitutes dampness? Not, by itself, the actual amount of the vapor or water in the air, for this may vary considerably in a dry atmosphere at different temperatures; but the degree of saturation of the air. A difference of only two degrees between the dry and the wet bulb means great dampness; a difference of four or five degrees is a comfortable average, neither moist nor dry; a difference of eight or nine degrees means excessive dryness. Now in Honolulu the difference is four or five degrees, with a variation in the monthly mean of absolute humidity of from 5.76 grains (January, 1899) to 7.03 grains (June, 1900). But equability, whether of dryness or of

humidity, is a more important factor of health in a climate than the actual amount of humidity, whether this be more or less. Excessive variability is the bane and the curse of the American climate, and of climates generally on the western aspect of the great continents.

From the experience of a long residence in Hawaii, I can say that while extreme wetness prevails in many regions, and is, of course, an inconvenience, still dampness or high saturation is not the rule. There is confirmation of this in the fact that fogs and mist at the sea-level are unknown in the islands. When there is not rain, there is sunshine; and the oppressive, stifling feelings that belong to our hot summer days with high saturation are not known except sometimes, as already said, during the prevalence of the warm southerly storms.

Except at Honolulu, few meteorologic observations other than those of rainfall have been recorded. The table on page 236, for the two years from July, 1898, to June, 1900, will show a uniformity in temperature, pressure, and humidity, almost as noticeable as are the range and vagaries of the rainfall in other parts of the group. Equally accurate observations are much needed for the outlying stations.

Disease and Mortality

In Honolulu, with an estimated population of 30,000, a total of 1585 deaths was reported for the years 1897-98. One hundred and sixty-one deaths were from phthisis, 135 from old age, 103 from cardiac diseases, 47 from bronchitis, 54 from diarrhea, 68 from pneumonia, 47 from paralysis, and 38 from cholera infantum. Of the total deaths, 798 were of Hawaiians, 359 of Chinese, 184 of Japanese, 141 of Portuguese, 108 of Americans, 42 of British, and 53 of other nationalities; these data show the highly composite character of the population. Leprosy exists in Hawaii, but the disease is promptly isolated, and foreigners are seldom attacked by it. The Hawaiian Government expended more than \$2,000,000 on the leper colony on Molokai, and its present cost is about \$100,000 annually.

The safety of living is complete—there are no noxious beasts, no

snakes, and no poisonous vermin save the centipede and the scorpion, and these are seldom, if at all, hurtful, as in hotter climates. The only really noxious creature is the mosquito. Introduced from San Blas, Mexico, at Lahaina, in the year 1826, by the careless skipper of the ship 'Wellington,' they speedily became a troublesome pest, and throughout the group the protection of mosquito-bars is required.

Resorts and Places of Residence.—HONOLULU, the capital town, while it may not be absolutely the most healthful, is the most attractive and best appointed place of resort in the Hawaiian group. There are good hotels and boarding-houses; the foreign visitor, however, will do well to hire a furnished bungalow and keep house for himself. Domestic service, generally Chinese, is good but expensive; and indeed the islands generally, since their annexation to the United States, have become a costly place to live in. The town has an excellent water-supply, brought from the mountains; the roads and other public works are in a high state of perfection. The residences of foreigners are well built, beautiful, and many of them very expensive; the suburbs are charming. The general aspect of the place suggests wealth; indeed, the foreign community, since the great development of the sugar industry, has become one of the richest, for its numbers, in the world. The society is excellent, and is all the more interesting because very composite, the American element, however, predominating. Many of the luxuries, as well as the comforts, of older communities may there be enjoyed, in conjunction with the *bien-être* and restfulness of the semitropic climate.

HILO, the second largest town on the islands, aspires to rival Honolulu commercially. In spite of its heavy rainfall, it offers attractions to the resident or tourist. It is a place of extraordinary beauty, is on the most frequented route to the volcano, Kilauea, and has comfortable accommodations for the tourist or invalid. The most vaunted climate is that of the Kona uplands, on the west side of Hawaii, a region famed for its fine coffee. For a philosophic retirement from the stress of the world that quiet region deserves all praise; but the invalid who desires variety in his surroundings would find Kona monotonous. On Maui may be

found attractive upland homes ; and nothing can be more beautiful than the quiet villages of Kauai.

The civilization of Hawaii is American and European, modified by the tropic conditions and even by the Polynesian character. The equable climate is not the only attraction—the scenery is beautiful and varied, the tours are interesting, although laborious, the conditions of home life are genial, and at the less rainy stations an almost continual outdoor life may be led. But it should be borne in mind that while physicians abound in Hawaii and good hospitals are not lacking, there are no sanatoriums as yet, and few hotels, save at Honolulu and Hilo ; indeed, the traveler must still often depend upon the hospitality that is freely offered. However, the following indications may be given :

Therapeutic Indications.—The invalid who seeks a region that is never cold and never oppressively hot will find it on any of the Hawaiian coasts, while lower temperatures may be enjoyed at the inland stations, as in the districts of Hamakua or of Kona, on the large island. The Hawaiian expects to live at a temperature of about 75° F., and enjoys exemption from all the climatic excesses of nature, except, as we have seen, from the heavy rainfall of many places.

1. Cases of **chronic bronchitis** and of **asthma** will often find benefit here. Captain Nottage ("In Search of a Climate") suffered from bronchitis with vesicular emphysema and catarrh ; the latter ailment was not relieved, but breathlessness, his chief trouble, was a little better. "I was able," he says, "to enjoy riding again, which I rarely can in England. Notwithstanding the exceptionally wet weather and southerly wind, I did not find [the climate] enervating ; on the contrary, I had twice the energy I have at home. . . . The islands certainly possess the most perfect climate. I have known" (pp. 41, 61).

2. Patients will here find indemnity from **malarious diseases**. These, in spite of the introduction of mosquitos, have never been endemic in the islands.

3. For patients suffering from **pulmonary tuberculosis**, except in its very early stages, this is *not* a suitable climate, though Dr. Trousseau, of Honolulu, has known of some recoveries in the second stage.

4. For those suffering from **overwork** or **exhaustion**, victims of labor or of pleasure, the islands offer an ideal place for recuperation.

5. For persons of **feeble resisting power**, as the aged and young children, the innocent Hawaiian climate is especially favorable ; and also for child-growth and development generally. The mild temperature permits outdoor existence and exercises of the most various kinds—riding, boating, swimming, games, mountain excursions. The rains are never cold, nor is there any chill at nightfall, so that even to be lost in the mountains is hardly a dangerous experience.

The climate is said by some to be relaxing, and to unfit the sojourner, or the native-born white, for resisting that of colder latitudes. This is certainly not the case in my own observation. Children born in Hawaii of American parents, on taking up a residence in the United States, cope quite as well with the racking extremes of the American climate as those born in the States ; nor have they shown themselves at all behind their progenitors in physical or intellectual stamina. It is rather to be said that their development was favored by their island training. The abundance of favoring conditions in Hawaiian life and the absence of noxious ones make the islands an especially favorable place for the **rearing of children**.

Under American transformation, as has been said, the cost of living in Hawaii has been increased ; and something of the charm of residence there has disappeared. But the health-seeker and the seeker for a home will still find in these islands, the so-called ' Paradise of the Pacific,' the best of tonics and calmants for the fever of life.



PART III
CLIMATOTHERAPEUTICS

1. The first part of the document is a list of names and addresses of the members of the committee.

2.

3.

4.

PART III

CLIMATOTHERAPEUTICS

Section I

GENERAL MANAGEMENT OF PATIENTS AT HEALTH RESORTS

CHAPTER I

THE THERAPEUTIC EMPLOYMENT OF CLIMATES, HEALTH RESORTS, AND SANATORIUMS

Change. Rest and Recreation. Exercise and Mechanotherapeutics. Diet, Milk Cures, Grape Cures, etc. Mineral Waters, Baths, and Hydrotherapeutic Treatment. Sea-bathing. Clothing. Medical Supervision, etc. Sanatorium Treatment.

THE ELEMENTS OF TREATMENT AT HEALTH RESORTS

It is often difficult to form an estimate of how much of the benefit derived from health resorts is due to climate and how much to associated influences. At any rate, it must be clearly understood, in regard to the climates and health resorts here recommended, that the climate is merely one element in the treatment; the various other elements, such as mental rest, cheerful surroundings, open-air life, altered diet and regimen, the use of mineral waters, and the like, will now briefly be considered.

Rest and Recreation.—In many conditions, such as insomnia and neurasthenia from overwork and exhaustion due to town life and social strain and worry, rest is an essential part of the treatment and must be considered in the selection of a health resort. In some hysteric and hypochondriac conditions, however, a certain

routine occupation, such as is necessary in following out the physician's prescriptions at health resorts,—such, for instance, as the internal use of mineral waters, baths, and other forms of hydrotherapy,—is serviceable. The patient's mind is thus occupied and his attention diverted from his own feelings; and the subjective element thus obviated is often one of the most important in the pathologic complexus. Open-air exercises and games, according to individual powers, are frequently desirable, as are mental recreations—*e. g.*, listening to music in the open air, etc. The soothing influence of cool, green woods in summer, and the enjoyment or exaltation derived from the contemplation of beautiful or impressive scenery, have a beneficial mental effect upon many individuals.

Exercise and Mechanotherapeutics.—It is necessary to consider only the great class whose indoor sedentary life has helped to induce dyspeptic, nervous, and other ailments, not to mention a host of gouty, plethoric, and obese patients, in order to recognize the great part played by judicious open-air exercise in many of the good results obtained at health resorts. In many cases, especially in persons with cardiac weakness, it is important that the exact quantity and kind of the daily exercise be regulated by the physician, and this can be managed admirably at places situated in broad valleys and surrounded by well-wooded slopes on which pleasant, shady paths at various inclinations have been constructed for level walking and for 'climbing' exercise.

When the late Professor M. J. Oertel, of Munich,¹ directed attention to the value of general climbing exercise ('Terrain-Cur') in the treatment of various chronic cardiac affections, a great impetus was given toward the utilization of health resorts for this purpose. Suitable localities—as, for instance, MERAN, REICHENHALL, BADEN-BADEN, and others—were termed 'Terrain-Curorte,' and at such places numerous level promenades and sloping paths enable patients to take graduated amounts of walking exercise in different directions. At some of these health resorts maps of the

¹ See "Ueber Terrain-Curorte zur Behandlung von Kreislauf-Störungen," Leipzig, 1886.

various paths have been printed, the physician being thus enabled to prescribe a series of walks for his patient and to regulate precisely the extent of each day's exercise and the time to be given up to it. When the exact regulation of the duration and intensity of exertion is not important, other forms of open-air exercise, such as cycling, riding, golf, and lawn-tennis, may be substituted for walking, in whole or in part.

For the various forms of massage, passive exercises, Swedish gymnastics, and the so-called 'resistance gymnastics,' including the exercises devised by the brothers Schott, of NAUHEIM, for cardiac affections, skilled treatment may be obtained at many health resorts. At some resorts, such as OEYNHAUSEN, in Westphalia, frequented by patients with nervous affections, systematic exercises, after the method introduced by Dr. Frenkel, of HEIDEN, in Switzerland, are made use of for cases of *locomotor ataxia*. All these forms of treatment are discussed in the volume on "Mechanotherapy."

Diet, Milk Cures, Grape Cures, etc.—For the many patients who visit health resorts on account of some disorder of the digestive and metabolic organs a certain attention to diet is, of course, of the utmost importance. For this reason table d'hôte dinners are somewhat inconvenient, and the à la carte system of many German and Austrian spas is, in the main, preferable. In some affections special diet tables may be advocated. Long-continued errors in eating and drinking induce many of the conditions for which persons seek relief at mineral water health resorts, and it is but natural, therefore, that at this class of places, rather than at simple climatic health resorts, most attention has been paid to diet. A special 'cure diet' was formerly observed by all patients at some spas, and traces of this custom still remain at Carlsbad and many mineral water health resorts. Individualization in diet, as in other matters of treatment, is now held to be preferable, and even during courses of mineral waters it is the patient's constitution and disease that should be considered rather than the precise kind of mineral water that he may be taking.

As a general rule, therefore, it may be said that there is no special diet for any particular health resort, but that the choice of

food and arrangement of meals must depend on the nature of the patient's complaint. This, of course, applies likewise to drinks. Great care should be observed in regard to the use of the local country wines by those whose stomachs are not accustomed to them. The diet as well as the general regimen should often be left to the local physician who is supervising the details of the climatic, balneotherapeutic, hydrotherapeutic, or other methods of treatment that may be adopted. In many gastric and intestinal complaints, as already stated, avoidance of table d'hôte and large meals is essential, and the local physician can assist the patient in regard to any difficulties to which this may give rise. When there is uncertainty as to the purity of the water-supply, information from him should be obtained as to what table waters or other beverages it is best to take. His instructions and supervision are still more important when the treatment is largely dietetic, as in grape cures and milk and whey cures, to which reference will be made further on.

Besides the nature of the patient's illness, his digestive peculiarities, and his previous habits, there remain to be considered the quite ordinary circumstances that influence appetite and digestive powers—such, for example, as the temperature of the air and the general bracing or sedative influences of the climate, the amount of exercise taken by the patient, and the time spent in the open air. These factors are, of course, at work at health resorts in the same manner as everywhere else, and cannot be discussed here. They are fully considered in the volume on "Dietotherapy." A word of caution is, however, necessary. The excitement of traveling and the change of surroundings at the commencement of a holiday or of a visit to a health resort often so stimulate the appetite that persons eat far more than they really require, and consequently suffer from biliousness and digestive disturbances that are further increased by the consumption of articles of diet to which they are not accustomed. Some persons at first suffer from diarrhea, in part of nervous origin, especially in young and excitable subjects, while, on the other hand, in many cases traveling produces or increases a tendency to constipation. The constipation, which in its turn not rarely leads to attacks of diarrhea, may be partly consequent on increased loss of fluid by the skin, owing to muscular exercise, or

on greater atmospheric dryness than the patient is accustomed to at home ; at times it may be partly accounted for by a diminution in the consumption of fresh vegetables, or if for any reason raw fruit must be avoided, by a difficulty in obtaining stewed fruit, or, perhaps, where the ground is chalky, by the constipating action of hard drinking-water. It is advisable, at the commencement of a journey or of a visit to a health resort, to limit the amount of food and to be careful as to the kind of food taken, and also, in many cases, to regulate the bowels by drugs or aperient waters. This is especially important in persons of gouty tendency who have been leading sedentary lives. In such cases the mental excitement and increase of muscular exercise seem often to induce an extraordinary discharge of waste-products from the system, shown by the urine becoming loaded with urates, by muscular and renal pains, and by biliousness; the excretory functions of the liver, like those of the kidneys, being probably overworked. Alkaline medicines and saline aperients may be employed in such cases.

Disorders of the same class are still more marked in visiting seaside localities, where the climate seems often to have the effect of stimulating the appetite without simultaneously increasing the digestive and metabolic functions to a corresponding extent.¹ In gouty patients and in patients with a tendency to constipation, biliousness, or hemorrhoids, the preliminary use of mercurial aperients may sometimes be recommended to ward off the disagreeable symptoms that in these cases frequently accompany sea voyages and visits to the seaside.

Some health resorts have a great reputation for the good milk, kumiss, or kephyr they provide, and others for their fine grapes, strawberries, etc. This matter is important for patients for whom a special dietetic use of milk derivatives or of grapes or other fruits is indicated ; it is still more important when a regular 'milk cure,' 'grape cure,' or similar special 'cure' is to be tried.

Milk Cures.—A milk diet serves to maintain the nutrition, and at the same time gives comparative rest to the digestive organs. It

¹ See "On the Biliousness Sometimes Induced by Sea Air," by Dr. F. Parkes Weber, "Treatment," London, January 11, 1900.

acts as a diuretic, clearing out accumulated waste-products, and, so to speak, cleanses the blood and the tissues of the body. Milk is a complete food, and cow's milk, which is usually employed, contains about 4.75 per cent. of sugar of milk, 3.5 per cent. of butter, 4 per cent. of casein and albumin, 0.75 per cent. of salts, especially calcium phosphate, and about 87 per cent. of water. Sometimes the milk of goats, sheep, asses, and mares is likewise employed, that of goats and sheep chiefly in the form of whey. Whey from goat's milk often has an unpleasant taste, but at many health resorts where goat's whey is employed this is obviated by keeping the goats on dry fodder and preventing them from eating the aromatic herbs to which the disagreeable taste is usually due.

Special courses of treatment with milk, kumiss, and the like are useful in some of the **dyspeptic conditions** of irritable nervous individuals and in various disturbances of the digestive organs; also in **gouty affections** and in **chronic diseases** of the **kidneys** and **urinary organs**. In some cases, especially in old persons, a milk diet is unsuitable, either because it gives rise to digestive troubles or because of an invincible dislike to this form of food. Sometimes milk lightly boiled is preferred,¹ or the food is better relished with the addition of aerated water, or of a little tea or coffee, or in the form of 'bread and milk.'

For some patients cream, or the German 'sour milk,' may be employed as a food instead of simple milk. Skimmed milk and buttermilk suit some cases better, and in others the fermented preparations, kumiss and kephyr, answer well and are agreeable to the patients. Whey, taken warm, has long had a special reputation in **chronic bronchitis** and **pulmonary affections**, and often helps to facilitate the expectoration, increase the appetite, and improve the general nutrition, although in itself it contains very little nutritive material. To prevent **uric acid gravel** from appearing in the urine, Dr. S. Gee recommends a large teacupful of fresh whey after each meal.

It is probable that milk, like mineral water, has been used too

¹ This or a process of sterilization is always to be recommended when the health of the cows is suspected.

freely in renal affections, especially, as Carl von Noorden points out, when there is a tendency to dilatation of the heart. In pulmonary tuberculosis, likewise, too large an amount of milk is occasionally recommended. Thus, Mitchell Bruce¹ observes that when the appetite of a phthisical patient diminishes, a purgative and several days of spare diet may be preferable to the abundant liquid nourishment usually insisted on.

The health resorts in Europe at which good milk, whey, kumiss, and the like are provided, for special courses of treatment or otherwise, are far too numerous to be mentioned here. Among the oldest are GAIS, APPENZELL, and HEIDEN, in Canton Appenzell, in Switzerland. In other parts of Switzerland, and in the Black Forest and in various parts of Germany, there are numerous climatic health resorts suitable for milk cures. Some German mineral water health resorts, such as OBERSALZBRUNN, REICHENHALL, and REINERZ are famous for their whey. In France, likewise, there are localities, such as GÉRARDMER, ALLEVARD, and CAUTERETS, where good milk, etc., can be obtained, and is occasionally recommended as part of the treatment. In Book I, Part II, of this work, many of these 'milk cure resorts' have been described and their comparative advantages pointed out.

Grape Cures.—A moderate quantity of grapes acts, in suitable cases, as a bland and easily digestible carbohydrate food. According to Koenig, the amount of grape-sugar contained in different kinds of grapes varies from 9.2 per cent. to 18.7 per cent. The quantity of grapes to be prescribed depends on individual peculiarities and on the effect that it is desired to produce. Large quantities have a purgative effect and lead to loss of weight. Relatively small quantities should be used at the beginning of the course, and the effect should be carefully watched in every case. Lebert,² who practised near Montreux, usually began with half a pound of grapes in the morning, fasting, and another half pound at 5 P. M., but for some patients who did not bear the grapes well when fasting he ordered the first portion an hour or two after a very light early

¹ "Principles of Treatment," 1899.

² Burney Yeo's "Climate and Health Resorts," London, edition of 1893, p. 313.

breakfast. Little by little he increased the dose to a pound on the average. In cases of chest diseases, however, he often did not go beyond the half pound. During the cure other food should be taken in moderation. Although the diet should be nutritious, it should not be too exclusively composed of animal food, and stimulating drinks, such as wine, coffee, and tea, should not be taken strong or in large quantities. Lebert considered it advisable, in dyspeptic conditions with chronic catarrh of the stomach, to progress slowly, not to exceed three pounds a day, and to regulate the diet carefully. Dr. Benno Laquer,¹ of Wiesbaden, points out that grapes relieve thirst, are slightly diuretic, and tend to lower the acidity of the urine; moderate quantities probably slightly diminish the excretion of uric acid. He has employed grapes as part of the treatment for obesity and constipation with satisfactory results, but the diet should be regulated, and other treatment, such as hydrotherapy, etc., may be required. The skins of grapes contain tannic acid, and therefore in cases of constipation Laquer employed the juice only. In general, however, he recommends that the skins be chewed before being ejected. The grapes should be washed before being eaten, and should not be too cold; a small quantity of white bread may be eaten with the grapes to protect the teeth, and the teeth may afterward be cleansed. Laquer recommends a gentle walk when the grapes have been consumed.

Before commencing a grape cure medical advice should always be obtained, for the results may prove as unsatisfactory as those that occasionally follow the excessive use of strawberries for some supposed medical purpose without medical advice.

The season for grape cures is generally from September to November, but varies, of course, in different places. On the Continent of Europe, MERAN, BOTZEN, ARCO, ABBAZIA, the neighborhood of MONTREUX, BEX, GLEISWEILER, DURKHEIM-AN-DER-HARDT, and various Rhenish localities are all suitable for grape cures. These and other grape-cure resorts have been described in Book I, Part II, of this work. In America, so far as the authors can learn, there are no institutions or localities that can specially be designated

¹ "Zeitschrift für diätetische und physikalische Therapie," 1899, vol. III, p. 45.

as resorts for milk cures, kumiss or kephyr cures, or grape cures. There is no reason why such methods of treatment should not be pursued successfully in the United States.

Mineral Waters, Baths, and Hydrotherapeutic Treatment.

—Although the climate at many health resorts is acknowledged to be of benefit, more importance is locally attached to treatment by mineral waters, baths, hydrotherapy, etc. In the present work these methods of treatment have frequently been referred to in describing the various spas, and they will be repeatedly alluded to when the selection of health resorts in special cases is discussed. The subject will, however, be more fully dealt with in the volume on "Hydrotherapy, Thermo-therapy, and Balneology." Mineral waters and baths are generally employed in the warmer seasons only, the places being closed during winter, or, as at St. Moritz, in the Engadine, open only as climatic stations.

Sea-bathing must likewise be mentioned, since the beneficial effect of residence at a seaside summer resort is sometimes due quite as much to the bathing as to the climate. Certain precautions should be observed. In delicate and timid persons and in children the treatment should be commenced with baths of warmed sea-water in the house or in a bathing establishment. The duration of baths in the sea should be extremely short at first, and should, in fact, never be very protracted, except in the case of the most robust individuals. Bathing in the open sea is generally to be avoided in chronic diseases of the ear and when there is a tendency to aural catarrh. When sea-bathing is followed by too great a degree of fatigue, by headache, or by a cutaneous eruption, the bathing should be of much shorter duration or should be abstained from temporarily or altogether. Unless thoroughly accustomed to it, one should never bathe in the open sea before breakfast—never without first taking some light food, as a biscuit, a cup of tea or milk, or something of the kind.

Clothing.—Patients often wish to know the kind of clothing they are to take with them to a health resort. This must depend, of course, on the kind of weather they are likely to encounter. A spell of bad weather may be a troublesome, unlooked-for factor in

climatic treatment, for at no place, not even in Egypt and the most famous climatic resorts, can constancy of the weather be relied on absolutely, and visitors should always be prepared in regard to clothing. On a Mediterranean trip extreme cold weather is sometimes suddenly and unexpectedly experienced for days together. For most persons, even healthy ones, flannel next to the skin is to be recommended for traveling, and especially for places where great and rapid variations in temperature, moisture, and wind occur. Thin flannel underclothing may be worn even in the tropics. Those subject to cutaneous irritation may wear silk; specially woven forms of cotton and linen, and of these, mixed with wool, are recommended for underwear by some travelers and a few physicians, but may be said to be still on trial. Information as to the average temperatures, winds, and sudden variations of temperature likely to be met with at a particular season of the year, and for which one ought at that time to prepare himself, can be sought for under the head of the particular health resort in question. With the special questions of outfit, food, etc., for explorers and persons who must visit unhealthful climates—*i. e.*, the reverse of health resorts—we are not concerned here.

Medical Supervision, etc.—For all who are seriously ill, and for many of the less serious cases, supervision by the physician at the health resort is required; the medical man, in fact, forms an essential part of the health resort, and upon his skill and tact depends much of the usefulness of the locality in which he practises. On reaching the health resort the patient should immediately consult him, and the advantages that one is likely to derive from this plan have already been explained in part. Neglect of this rule often leads to troublesome symptoms of more or less importance that might easily have been avoided, and for which the climate and arrangements of the health resort in question are often unjustly blamed. The first exhilarating effects of change of climate, scenery, and surroundings frequently induce a patient to eat too much and to overexert himself in various ways. While sight-seeing, many persons will unnecessarily expose themselves to chills; anemic persons will take long walks and otherwise tire themselves in order to keep company with their more healthy friends; all such evils can and

must be prevented by the influence of the local physician. He has often to regulate the diet and the amount of exercise, and to give the patient directions as to clothing and how to make the best use of the fresh air. He can best advise as to what baths and hydrotherapeutic treatment are required, and whether massage, Swedish gymnastics, and electric treatment should be employed. In regard to mineral waters he must prescribe the proper amount, the time of day at which the water is to be taken, whether it is to be taken at the natural temperature of the spring or artificially cooled or heated, and whether it is to be taken alone or mixed with salts, milk, whey, etc. In no case except the mildest should a health resort be selected where efficient medical supervision cannot be obtained.

Sanatorium Treatment.—The personal supervision by the physician can generally be better carried out in special institutions than if the patient is residing at a hotel or in a private house. This is one of the causes that has led to the establishment of a great number of private sanatoriums where there is resident medical superintendence, or where, at least, effectual medical supervision can be carried out. A number of dietetic establishments have been founded in Germany and elsewhere during the last fifteen or twenty years. Some of the best known of these are at HEIDELBERG, WÜRZBURG, FRANKFURT-AM-MAIN, KISSINGEN, NEUENAUH, WIESBADEN, BADEN-BADEN, and other resorts mentioned in Part II. At such establishments dietetic and other treatment for digestive disturbances, diabetes, obesity, and other disorders of metabolism can be thoroughly carried out, and the effects of experiment in diet, drugs, etc., can be more accurately observed. There are, likewise, a great number of private sanatoriums for cutaneous affections, nervous affections, diseases of women, etc., which provide special facilities for treatment and medical supervision. In some cases the restraint imposed upon the patient at such establishments is the chief factor in the success of the treatment—for instance, at institutes for dipsomaniacs and morphinomaniacs. Well-conducted sanatoriums, moreover, favor the investigation and study of special diseases, and will probably be more and more made use of in the future. Special hospitals for particular groups of diseases, such as are now found in all large cities, are really special sanatoriums for the poorer class of

patients. It is often more difficult to obtain equal facilities for the well-to-do.

In the treatment of pulmonary tuberculosis the utility of special sanatoriums has in recent years been everywhere acknowledged. The main characteristic of these institutions is the value attached to open air, or rather to pure air, to a nourishing diet, and to the personal medical supervision of each patient. The physician comforts the patient, gives him courage and hope, prevents him from over-fatiguing himself, from remaining too long without food, or from otherwise diminishing his chances of recovery; and regulates the amount of exercise, the special pneumatic measures, the tonic hydrotherapeutic treatment, etc. From residence in institutions of this kind the patient acquires hygienic knowledge and habits and learns how to avoid infecting others; in fact, the treatment is 'educational,' and will almost certainly be useful to the patient in his subsequent life—and not only to the patient himself, but also to other persons with whom he lives or with whom he comes in contact. It is unlikely, in most cases, that the disease can be cured permanently by a few months' residence in a sanatorium, but the patient learns how to regulate his daily life, and, by continuing the hygienic mode of living, will have the best chance of battling successfully with the disease and ultimately getting rid of it. The same methods that would probably have prevented the disease if they had been adopted early enough are made use of in the sanatorium or 'open-air' treatment, to increase the patient's general strength and resisting powers, so as to enable him to cope with the disease after he has been attacked.

Sydenham, and later Beddoes¹ and John Baron,² like their great American contemporary, Benjamin Rush,³ of Philadelphia, recognized and taught the main principles of reinvigoration by physio-

¹ "Observations," "Essays," "Letters," etc., Bristol and London, 1793 to 1802; see especially "Hygeia," Essay vii, Bristol, 1802; cited by S. Solis Cohen, article "Tuberculosis," in Hare's "System of Practical Therapeutics," vol. 1, Philadelphia, 1891.

² "An Enquiry Illustrating the Nature of Tuberculated Accretions," etc., London, 1819, quoted by Cohen, *op. cit.*, p. 926.

³ "Medical Inquiries and Observations," Philadelphia and London, 1789, second edition, 1805; cited by Cohen, *op. cit.*

logic means in the treatment of consumption; and, of more recent writers, in England, George Bodington,¹ of Sutton-Coldfield, enunciated the hygienic principles of treatment in regard to diet, fresh air, and the like, as early as 1840. Dr. Henry MacCormack, in Ireland, like his compatriot, Graves, specially insisted on the avoidance of confined air, but the practical introduction of the systematic open-air and general hygienic treatment of pulmonary tuberculosis is due to Dr. Hermann Brehmer, who founded his private sanatorium at GOERBERSDORF, in Prussian Silesia, in 1859. The sanatorium at FALKENSTEIN in the Taunus was founded at the instigation of Frankfurt physicians in 1874, and was opened in 1876. Dettweiler, a former assistant of Brehmer, in his management of the Falkenstein establishment introduced certain modifications of Brehmer's treatment, especially the various arrangements to enable patients to rest lying down in the open air in nearly all weathers during the greater part of each day. The excellent results obtained at these two establishments have led to the foundation of a number of different private sanatoriums not only in Germany, but in every country of Europe and in various parts of America. Many of these have been spoken of in Part II of this work. Here we need mention as examples only the sanatorium of HOHENHONNEF on the Rhine, those at GOERBERSDORF besides Brehmer's original one, those at high altitudes in Switzerland (DAVOS, AROSA, LEYSIN), those in the BLACK FOREST, in SAXONY, and in

¹ In an essay on the "Treatment and Cure of Pulmonary Consumption," published at London in 1840, on page 44 Bodington writes: "The generality of the medical profession have not the opportunity of thus treating their consumptive patients; if they are to succeed, they should have country houses in proper situations, well ventilated, and provided with all 'appliances and means to boot,' where their patients should be under their own eyes, and strictly watched and regulated in all respects as regards exercise, air, diet, medicine, etc.; or there should be a certain class of practitioners who should exclusively pursue this practice as a distinct branch, to whom those in the large towns should confide their consumptive patients. With respect to the consumptive poor patients, those who cannot afford to pay for a proper treatment of this sort, hospitals should be established in the vicinity of large towns, in fit situations, and properly appointed in all respects for their reception and treatment. In these there should be provision made for affording them carriage or horse exercise, and gardening and farming occupations for the convalescent. The common hospital in a large town is the most unfit place imaginable for consumptive patients."

THURINGIA. Every country in Europe is providing itself with sanatoriums for the treatment of pulmonary tuberculosis. In England private sanatoriums have already been opened at BOURNEMOUTH ; near the NORFOLK COAST ; in the MENDIP HILLS ; in the NEW FOREST ; in the COTSWOLD HILLS ; in hilly districts near LONDON ; and in other places. The ADIRONDACK COTTAGE SANATORIUM and the LOOMIS SANITARIUM in the mountainous regions of the State of New York, the SHARON SANATORIUM, near Boston, the RUTLAND SANATORIUM, also in Massachusetts, and the MUSKOKA SANATORIUM, in Canada, are well known, and other establishments of the same kind have been established and are successfully conducted in various parts of the United States.

The lines of treatment adopted at all these sanatoriums are similar in their broad principles, but at some of them especial attention is paid to certain details. At NORDRACH, in the Black Forest, under the direction of Dr. Walther, especial importance is attached to the amount of food, while the large open galleries or verandas ('Liegehallen') in which patients at Falkenstein and Hohenhonnef spend much of the day reclining on their couches are not in favor. Exact directions are, however, given to each patient as to the amount of walking and resting in the open air. For feverish patients and others specially needing rest Dr. Walther prefers to prescribe absolute rest in the thoroughly well-ventilated and well-situated private rooms. Some physicians maintain that the patients are inclined to quarrel, become excited, or talk too much when gathered together in galleries. In England many of the sanatoriums claim Nordrach rather than Goerbersdorf and Falkenstein as their model.

Tuberculosis can, however, be efficiently combated only when means have been provided for dealing with its poorer victims. In this respect England has led the way by the early establishment in London of special hospitals for the poorer class of patients, and by the erection of the well-known 'Royal National Hospital' (1869) at VENTNOR, in the Isle of Wight, and the 'National Sanatorium for Consumption,' instituted in 1855, at BOURNEMOUTH. This example has been followed elsewhere ; a temporary sanatorium for poor consumptives was established in 1892 at FALKENSTEIN, close to the celebrated private sanatorium managed by Dr. Dettweiler.

In 1895 a much larger sanatorium for poor patients was erected at the neighboring RUPPERTSHAIN, and the small one at Falkenstein was discontinued. Now there are numerous sanatoriums for poor consumptives in different parts of Germany and Switzerland, and to a less extent in other countries. Near London, the **Mount Vernon Hospital** at HAMPSTEAD, 300 feet above sea-level, is an excellent example of a sanatorium for poor consumptives where the 'open-air treatment' is thoroughly carried out. More institutions, however, are urgently needed: not only sanatoriums for patients who are 'favorable cases' and have a good chance of recovering so far as to be able to earn their living again, but also homes for the advanced and hopeless cases, where the poor patients may spend the remainder of their life in as comfortable circumstances as possible, without the danger of infecting others. The institutions in the United States already mentioned are principally for patients who can pay but a moderate fee, and even this is largely provided for by special funds established by charitable persons. The **Rush Hospital for Consumptives** at Philadelphia, and the special phthisis wards of the **Philadelphia Hospital**, make partial provision for the consumptive poor of that city. New York, Chicago, Boston, and other large cities have similar wards or special hospitals. Near many of the large cities there are institutions such as the **Montefiore Home**, near NEW YORK, and in the suburbs of PHILADELPHIA, the **Lucien Moss Home**, at Olney, and the **Chestnut Hill Home**, of the Protestant Episcopal City Mission, where patients are received entirely without fee, and kept largely in the open air.

The charitable sanatoriums for scrofulous and weakly children are of almost equal importance. The **Royal Sea-bathing Infirmary** at MARGATE, founded in 1791, was the earliest of this class of institutions. The largest, however, and probably the best known, is the French one inaugurated in 1869 by the '**Assistance Publique de Paris**' at BERCK-SUR-MER, on the English Channel. In Part II were mentioned a large number of these institutions scattered over the coast of Europe, as well as some similar ones at various inland localities, especially those provided with brine springs that can be employed for stimulating baths. The **Children's Seaside Home** at ATLANTIC CITY, New Jersey, may likewise be referred to.

CHAPTER II

THE SELECTION OF HEALTH RESORTS

Constitution of the Patient. Journey to the Health Resort. The Season of the Year. The Expense of Treatment. The Inclinations of the Patient. Opportunities for Open-air Treatment. Selection of Dwellings.

In advising a sojourn at a health resort, the physician must take quite a number of circumstances into account. Not only the action of the climate, mineral waters, baths, etc., but also the probable effects of the proposed journey, the removal from home surroundings, the altered diet and altered mode of life, have to be considered. Some knowledge of the local medical man is of great importance in the selection of a health resort, but to this we have already referred. Climate is, unfortunately, an unstable agent, the variations in which cannot be foreseen. Egypt has been supposed to have the most uniform climate, one on the action of which the physician could rely almost as much as on a dose of some drug of known strength and quality, but Sir H. Weber, from his personal experience, thinks that, after all, Egypt forms no exception to the rule.

In the medical treatment of chronic disorders, the physician's aim must be, first, to remove the injurious influences that are causing the disease, and, secondly, so far as possible, to restore the normal functions of the organs. The first of these objects may often best be effected in practice by removing the patient for a longer or shorter time from his usual work and surroundings. It is partly owing to rest and recreation ¹ that treatment by climates and health resorts often succeeds when ordinary medicinal treatment, and sometimes every kind of treatment at home, has failed. The stay at a health resort necessitates cessation of ordinary work and practically complete change of environment. In many morbid conditions change

¹ We have already alluded to the effects of rest and recreation in regard to treatment at health resorts.

of itself does good, as traveling by sea or land, or temporary change of residence from a large town to the country, or vice versa. Hippocrates said, "In chronic diseases it is advisable to go to another country." Mental and social conditions doubtless often play a part in the effects apparently due to 'mere change.'

Sir H. Weber (von Ziemssen's "Handbook") says, in regard to old persons: "The fact must not be lost sight of that in them all functions, both of the mind and of the body, have a tendency to become torpid unless they are kept in constant exercise, so that it is necessary to keep the faculties in action by stimulating body and mind. For this reason voyages are indicated, and residence at places where the mind is stimulated by social intercourse, art treasures, and other resources, and where at the same time facilities for bodily exercise are offered." This subject will be referred to again further on.

Even in tuberculosis, although the tubercle bacilli cannot be at once removed by change of surroundings, yet the injurious agents—insufficient food, impure air, etc.—that have lowered the vitality of the body and enabled the pathogenic parasites to gain a footing can be got rid of by the judicious selection of a climate or sanatorium.

In regard to the second object to be obtained by treatment,—namely, the restoration of the proper functions of the organs,—it is the constitution of the patient that the physician must specially consider.

Constitution of the Patient

Under this term we include the general strength and the reactive peculiarities of the individual. Strong constitutions may be due to inheritance or to the physical influences that have acted on the person during early life. Weak constitutions are often inherited, but are frequently also the result of improper feeding and insufficient opportunity for proper physical development by open-air exercise. Nervous irritability is the characteristic of some constitutions, and in selecting a health resort for these constitutions the avoidance of all sources of excitement and unnecessary irritation is to be the first aim.

On the other hand, in the 'torpid' class of persons the nervous

system is less readily influenced, therapeutic agents produce a less obvious effect, and in general a more active kind of treatment, combined with stimulating mental influences, is required.

The reactive power of the constitution in regard to cold, fatigue, etc., is of great practical importance, and it is the physician who is most familiar with the peculiarities of his patient in this respect who is most likely to be successful in his treatment. A powerful reaction belongs mostly to the strong constitution, but strong measures are often required to produce it, whereas in irritable weak constitutions the reaction is generally excited more rapidly and by less violent means. Thus in strong constitutions the sharp action of a purgative is generally followed by increased appetite and working power; in weak constitutions it often leads to some degree of depression, recovery from which is more or less slow. In strong constitutions even a great amount of fatigue is soon recovered from, and is followed by a pleasant feeling of increased vigor; whereas in weak constitutions great exertion may be followed by a long-continued loss of working power, both physical and mental. A man of vigorous constitution is often greatly benefited by a long period of abstinence or underfeeding, and in such persons this simple method of dietetic treatment may in itself be sufficient to bring about recovery from many ailments. Temporary loss of weight and diminution of working-power are in these persons rapidly followed by increase in weight and vigor when they return to the average amount of food. In weak constitutions, underfeeding may have a very different effect, and to a certain extent even the strict observance of fast days in the Roman Catholic Church may exercise an injurious action, for such weak persons have apparently little nutrient material to draw from. Often they stand overfeeding as badly as underfeeding, and when they attempt to live 'generously,' immediately suffer from indigestion, rheumatic pains, and metabolic disturbances of various kinds. In estimating the constitution of the patient, the general appearance, the vascularity of the skin, and the quantity of muscle and subcutaneous fat may help the physician. He may, likewise, learn much by ascertaining how the pulse reacts to mental excitement and sudden physical exertion, whether the skin is usually dry or whether there is a tendency to excessive perspiration, whether

the patient is peculiarly liable to coldness of the hands, feet, and nose, whether he feels stronger, happier, and capable of more work in summer or in winter, and whether the family history shows a tendency to longevity or the reverse. Some of these points will be referred to again in discussing the climatic treatment of tuberculosis.

In selecting climatic health resorts it is in all cases important to ascertain whether the patient endures cold well or badly. Many patients, like most healthy persons of strong constitution, are invigorated by cold weather; especially is this the case in large eaters and persons with a tendency to abdominal plethora and corpulence, to somnolence in hot weather, and to a torpid type of hypochondriasis. Some delicate persons, on the other hand, are likely to suffer from loss of appetite, constipation, coldness of the extremities, mental depression, anemia, and amenorrhea in cold weather. Some persons always have coryza or catarrhal affection of other mucous membranes in winter. Others, especially children and young persons, develop chilblains on their hands and feet or transverse atrophic furrows across their finger-nails, or, in rarer instances, a recurrent cutaneous affection ('winter eruptions') when exposed to cold. Raynaud's disease and the milder forms of Raynaud's symptom complex, to which the editor of this system has called attention,¹ occur most frequently in cold weather; while in warm weather there may be undue relaxation of vessels. Paroxysmal hemoglobinuria has been avoided by migration to warmer climates. All these considerations may furnish hints in the selection of a climate.

Journey to the Health Resort

The question sometimes arises whether or not the patient can stand the journey to the health resort. In such cases the knowledge of the patient's previous habits and reactive powers may greatly help the physician in drawing a conclusion from the data furnished by his examination of the present condition. In any case, when there is weakness, every precaution ought to be taken

¹ "Vasomotor Ataxia, a Contribution to the Subject of Idiosyncrasies," by S. Solis Cohen, "American Journal of the Medical Sciences," February, 1894.

to lessen the fatigue of traveling as much as possible. The journey should be planned carefully beforehand, and resting places should be definitely selected. In trains specially adapted for invalids a long journey can often be accomplished, even by weak persons, without excessive fatigue. In some cases frequent stoppages are necessary, and sometimes a stay of several days' duration at one or more places on the route is advisable. Some patients bear night traveling badly, but during the heat of summer the night is often the most agreeable time for a journey. In very hot weather, traveling may sometimes be limited to the early morning and the evening hours.

The season of the year naturally influences a physician largely in the choice of a health resort; not only does the climate differ greatly at different times of the year, but some health resorts are open only during a limited season. The accommodation is often better at one season of the year than at another; moreover, mineral water treatment, medicinal baths, and the like, are not available during part of the year in many health resorts that have an especial mineral water season. Still more important is the fact that the resident medical men in whom confidence is placed may be present only during the chief season. At some health resorts the middle of the summer may be too hot; or the crowding or fashionable excitement may be too great at the height of the season for some patients.

The expense of treatment and various social considerations often limit the choice among health resorts. Treatment at such places is generally costly, but the expense varies greatly according to the degree of fashionable favor the place enjoys, the quality of the accommodation, the time of the year,—whether at the height, the commencement, or the end of the season,—and the quarter of the health resort selected for residence.

The inclinations of the patient must necessarily affect the choice of treatment, and when different methods are applicable, even the physician's advice may often have to be modified by the mental attitude of the patient. Some persons will refuse to leave their

friends and relatives to visit a health resort ; others long for bright vegetation and a clear sky. Thus H. Weber and M. G. Foster say : " More than once, especially in former years, patients would tell us they would rather die in the enjoyment of the subtropic beauty of Funchal, than fight for life in the ice-bound Alps, or at the dusty Riviera, or in sunless England."

Opportunities for 'Open-air' Treatment.—It is not only in pulmonary tuberculosis that 'open-air' treatment is of use : it may be employed with advantage in various local tuberculous affections, some neurotic disorders, and certainly in chronic gouty disorders in which there is imperfect combustion of waste material. In most cases, therefore, it is important to select a health resort where there is a large number of good paths,—shady ones are necessary in hot weather,—both level paths for ordinary walking, and gently sloping paths for climbing exercise. In many cases not only should there be opportunities for exercise in the open air, but there should be abundant facilities for **resting in the open air** as well. There should be properly constructed verandas, provided with invalid chairs of the 'chaise-longue' kind, for reclining ; hammocks should be furnished for use in the woods, and there should be comfortable seats at various spots along the paths ; the so-called 'sun-traps' are also desirable, as are seats with high backs that can be turned round to afford shelter from the wind. Of course, there must be chairs for invalids to be wheeled about in, and carriages for driving. In some cases one of the main advantages derived from selecting a warm locality for winter is that the patient, besides taking his exercise out-of-doors, can spend much time resting in the open air. Rest upon deck, in the sun or shade, according to circumstances, is sometimes one of the chief benefits of a sea trip.

Before considering the selection of climates and health resorts in special cases, a few words must be said on **the selection of rooms and dwellings in health resorts**. The selection of the house or the hotel is often a matter of some importance. The differences between different hotels and lodging-houses in regard to sanitary arrangements, general comfort, quality of the food and

cooking, expense, and class of society need hardly be mentioned. The situation and aspect of the dwelling and of the patient's room must be ascertained, for the shelter from wind, the elevation, sunshine, look-out, and nature of immediate surroundings often vary much in different parts of many health resorts. Thus, there may be a difference of 300 feet and more in altitude between different portions of the same place. At seaside places the houses bordering the seashore or harbor have a different climate, in regard to winds, etc., from that of houses built on slopes or cliffs 100 or 200 feet above them, often at a considerable distance from the shore. In inland resorts some of the houses may be situated in a kind of hollow, while others situated on adjoining slopes or plateaus have a much more bracing climate. The houses built on rather steep slopes necessitate too much climbing exercise for patients with dilated hearts and like disabilities. Hotels on the outskirts of a health resort sometimes have the advantage of standing in large grounds of their own, and sometimes of adjoining large forests and the open country, and of being comparatively removed from the dust and glare of chalky or sandy roads.

Even the kind of furniture provided, the decoration of the rooms, halls, and verandas, and similar matters of taste, are of some importance, because these may conduce to cheerfulness or the opposite; and cheerfulness has a most beneficial influence in chronic ailments.

During the hottest months, the highest story of the house and the western and southwestern rooms on which the sun shines during the evening hours, are to be avoided by those who cannot sleep in hot rooms. The upper stories are, needless to say, unsuitable for aged and enfeebled persons, especially persons with dilatation of the heart, unless there is a good elevator.

Section II

SPECIAL THERAPEUTICS

CHAPTER III

CONVALESCENCE, DEBILITY, AND HEMIC DISORDERS

Convalescence from Acute Diseases. Anemia and General Debility—Chlorosis.

In discussing the utilization of health resorts in different diseases and morbid conditions, some general plan is necessary, although a certain amount of repetition is unavoidable. In the following pages we shall commence with certain disordered conditions of the general health and affections of the metabolic functions, and then proceed to systems and organs. It will be found that pulmonary tuberculosis has been placed together with other tuberculous affections before the affections of the respiratory organs. The arrangement is not, however, to be regarded as a strictly methodic one: we have endeavored only to make it as convenient for our purposes as any classification can be. It must, moreover, always be kept in mind that it is not merely the disease from which the patient is suffering that must be considered, but likewise, and even more so, the patient himself, his constitution, his habits of thought and living, and his peculiarities.

CONVALESCENCE FROM ACUTE DISEASES

There are few conditions for which climatic health resorts are more often visited than for weakness and imperfect recovery after acute diseases. In some cases, indeed, recovery may be rapid, but even then it is almost always advisable to prevent the patient from

returning to his customary work and mode of life immediately. A prolonged period of rest amidst healthful surroundings is, however, absolutely required when convalescence is delayed. In such conditions there may be a feeling of lassitude, with inability for concentration of thought and a tendency to irritability of temper from the slightest cause ; the least physical exertion may increase the pulse frequency from 60 or 70 to 100 or much more in the minute. For many patients a stay in some **country district**, with pure air and amidst cheerful social surroundings, for others, a leisurely **holiday tour**, is all that is required. Individual circumstances must frequently, however, be taken into consideration. In many cases **ocean voyages**, or, especially in children, a sojourn at a fairly bracing **seaside health resort**, may be recommended ; but sea air may be unsuited to the patient, owing to a tendency to eczema, gout, biliousness, and gastric disturbance ; in any case the time of year must influence one's choice. Of **inland summer resorts**, fairly sheltered places of moderate elevation are generally preferable to those of high elevation ; during the hot months of the year it is important that there should be neighboring woods, the shade of which will enable patients to remain in the open air during the heat of the day. In spring and autumn, inland health resorts of low or moderate elevation, the summer climate of which would be rather too hot, may be selected. Many of these places are situated on the borders of **inland lakes**, such as the large lakes of Switzerland and Italy, and, although rather colder, the lake districts of England and North America, where the beautiful surrounding scenery exercises a most beneficial effect on the patient's mind. During **winter**, one of the warmer and more equable seaside health resorts, such as those in the southwest of France—*e. g.*, BIARRITZ, ST. JEAN-DE-LUZ—and those on the RIVIERA and AUSTRIAN ADRIATIC (Abbazia) and other MEDITERRANEAN coasts may be selected according to the constitution, the inclinations, and the means of the patient. In the United States, the NEW JERSEY seaside resorts, LAKEWOOD, HAMMONTON, or vicinity in the same State, the coast of FLORIDA, and the coast region of southern California, from SANTA BARBARA to CORONADO, are suitable.

At seaside resorts during summer sea-bathing may be of use for

the more robust class of patients, but great care should be observed. For weaker patients, baths of warm sea-water, analogous to the brine baths ('Soolbäder') of inland health resorts, may be employed. In some cases the judicious use of hydrotherapeutic treatment (cold or tepid douches, etc.) may likewise have a most beneficial tonic influence.

Mineral water health resorts may sometimes be availed of. Thus, when there is a tendency to cardiac weakness, natural tepid effervescent baths, like those of OEYNHAUSEN and NAUHEIM, owing to their reflex effect by stimulation of the skin, are likely to be of use. In many cases, especially in weakly children, ordinary brine baths have a decidedly strengthening effect. In recovery from localized peritonitis and after inflammatory affections of the pelvic viscera a course of **simple thermal baths** not rarely exercises a curative influence. Thus, the baths of PLOMBIÈRES have been especially advocated in chronic pain and distress following appendicitis, and likewise during convalescence from this affection, whether an operation has been performed or not. The hot local and general **baths of mud and peat**, which can now be obtained at very many health resorts of Europe, sometimes give relief in convalescence from various diseases associated with neuralgic troubles. These baths are likewise successfully used at LAS VEGAS, New Mexico, and KLAMATH HOT SPRINGS, California.

The **internal use** of mineral waters is also occasionally indicated. Thus, when there is a tendency to anemia, a course of treatment at chalybeate spas may be advised, such as SPA, in Belgium, SCHWALBACH, in the Taunus, PYRMONT, in Waldeck, and others, or when a high altitude is required, ST. MORITZ, in the Engadine. In convalescence from attacks of bronchitis, when there is a tendency to chronicity of the bronchial disturbance, benefit may sometimes be obtained by a course of **muriated alkaline waters**, as at EMS, in Germany, at ROYAT, in the Auvergne Mountains, or at GLEICHENBERG, in Styria, etc.; sometimes health resorts with **sulphur waters**, such as EAUX BONNES and other places in the Pyrenean valleys, act equally well or better. The tendency to constipation found in many convalescent patients may be relieved at home by the occasional use of aperient mineral waters, as well as by ordinary pharmaceutic

remedies ; but in some of these cases a course at one of the health resorts, with **aperient muriated waters**, such as **KISSINGEN** and **HOMBURG**, will prevent constipation and promote diuresis and the removal of waste-products.

In the United States, the **GREENBRIER WHITE SULPHUR SPRINGS** in West Virginia, the **RED SULPHUR SPRINGS** in Monroe County, and **CAPON SPRINGS**, in Hampshire County of the same State, are well suited for treating this class of affections. They are, however, available only during the summer and autumn, and the Red Sulphur Spring is not so well provided with accommodations as the famous old 'White Sulphur.' The Red Sulphur water seems to possess the power of allaying bronchial irritation and diminishing expectoration. One of the best and most available resorts for convalescents is **ATLANTIC CITY**. It has good accommodations for over 50,000 guests in its hotels and smaller houses, and in winter and spring much benefit may be derived from a short visit there after almost any acute illness. **OLD POINT COMFORT, VIRGINIA BEACH**, and the inland resorts of **NORTH and SOUTH CAROLINA, PALM BEACH** and the chain of famous resorts on the east coast of **FLORIDA**, are particularly suited for those debilitated by bronchial or laryngeal affections, mental and physical fatigue, and in convalescence from almost any acute disease. The **BERMUDA ISLANDS** are also admirably adapted for some patients, especially young women.

Convalescents, to whatever health resort they are sent, must observe special precautions ; they must avoid mental and bodily fatigue, great heat, great cold, and violent winds ; they must be careful in their diet, keep their bowels open, wear warm clothing, and attend to the functions of the skin. Suitable recreation should be provided if possible, and an interesting occupation or 'hobby' prevents undue impatience and mental depression.

ANEMIA AND GENERAL DEBILITY

Chlorosis we consider as a variety of anemia occurring in females, arising probably from a temporary disorder of the hematopoietic functions connected with the development of the sexual organs.

According to Lorrain Smith's recent researches, the volume of the blood is increased in chlorosis and the total capacity for absorbing oxygen remains about normal, whereas in pernicious anemia the condition more closely resembles the anemia from hemorrhage, and the capacity for taking up oxygen is much diminished. In most cases rational home treatment, with attention to resting in pure air, suitable diet, and the proper action of the bowels, together with the administration of suitable preparations of iron, is quite sufficient without the aid of special climates or of health resorts. In severe cases, moreover, the weakness may be so great that any exertion, even a short journey to a health resort, is injurious. In very mild cases a visit during summer to mountain resorts of tolerably high altitude is often useful. If it be admitted, as seems probable, that in such mild cases, although the blood is somewhat watery (hydremia), the total quantity equals or even exceeds the average, the dry air of high altitudes may be supposed to exert its beneficial effects by increasing the evaporation from the lungs and skin, and thus rendering the blood more concentrated. The number of red blood-cells passing through the capillaries of the lungs in a given time would then be increased, and the oxygenation of the whole body would be promoted and the metabolic processes favored.

No climate, however, is specific against chlorosis; it may occur anywhere. When the constitution is fairly strong, **tonic inland climates** seem generally to act better than the warm moist seaside climates, which latter often seem to exert a relaxing effect. In the seaside climates of the south and southwest of England, cases of chlorosis seem to be as abundant as anywhere, and Dr. G. A. Leon, of Sidmouth,¹ has no doubt that this complaint is particularly common among young girls in Devonshire valleys.

There are some chlorotics who do not bear well the ordinary pharmaceutic preparations of iron, but who can take **mineral chalybeate waters** with advantage. In such cases SPA, PYRMONT, SCHWALBACH, and other health resorts with gaseous chalybeate springs are often useful. In other cases spas like HOMBURG and KISSINGEN answer better, owing to the waters containing sodium

¹ "Journal of Balneology and Climatology," London, January, 1900.

chlorid as well as a certain quantity of iron bicarbonate. Spas with **muriated alkaline chalybeate waters**, like ROYAT, with its tonic climate, in the Auvergne, are sometimes serviceable, and waters containing **arsenic**, in association with **iron sulphate**, such as those of LEVICO and RONCEGNO, in southern Tirol, may likewise occasionally be prescribed. In very mild cases **high altitude resorts** with **gaseous iron bicarbonate waters**, such as ST. MORITZ, in Switzerland, and SANTA CATARINA, in the Italian Alps, often do good. When there is much constipation, **pharmaceutic laxatives** or **aperient mineral waters** can be used simultaneously.

In the United States, the most available **chalybeate springs** with suitable accommodations for invalids are SHARON SPRINGS and RICHFIELD SPRINGS, CRAB ORCHARD and OAK ORCHARD SPRINGS, in Genesee County, New York, the FAUQUIER WHITE SULPHUR, West Virginia, JORDAN WHITE SULPHUR, MASSANETTA, MONTGOMERY WHITE SULPHUR, and RAWLEY SPRINGS, in Virginia, the NEW ALMADEN Vichy, CONGRESS spring, GEYSER SPA spring, and NAPA SODA spring, in California, THORP'S SPRING, in Wood County, Texas, the OJO CALIENTE SPRING, in New Mexico. The OWASSO mineral water in Shiawassee County, Michigan, is a strong **chalybeate water**, but the locality has not been utilized as a resort. The IRON UTE MANITOU SPRING, in Colorado, is an excellent **chalybeate water**.

Cheerfulness of surroundings is very important in the treatment of chlorotics, for a condition of mental depression is sometimes the determining cause of the chlorosis, and cure not rarely follows removal of the depression. Among cases of anemia it is perhaps the chlorotic class in which most supervision must be exercised in regard to the avoidance of fatigue. Here the influence of the resident physician at the health resort must make itself felt, for chlorotic patients and their friends have often a firm belief that any amount of exercise in the pure open air must necessarily do them good. It is owing to this wrong impression and the absence of medical supervision that these patients frequently come back from health resorts rather worse than when they started.

Besides the ordinary form of chlorosis, there are **other anemic conditions** that occur in young females and are often incorrectly included under the same heading. In some of these cases the

anemia seems to be due to a structural, or merely functional, permanent or transitory **defect in the development of various organs**. Professor Virchow's cases with hypoplasia of the arterial trunks may be classed in this group; in other cases there may be hypoplasia of the sexual organs, and perhaps hypoplasia of the bone-marrow. In these patients the nutrition of the whole body must be favored by general hygienic methods, and the earlier in life the treatment is instituted, the more likely is it to lead to a gradual improvement. Good food, plenty of fresh air and sunlight, cheerful surroundings, and regulated exercise are necessary. **Tonic climates** and **bracing sea air**, according to the general powers of resistance, are indicated during childhood, and, likewise, the habitual use of tonic hydrotherapeutic measures, such as a cool douche and friction after a short tepid morning bath. Health resorts with **muriated or chalybeate waters** can sometimes be recommended in addition. In this class of cases the structural defect in development is not necessarily permanent, and under these methods of treatment the anemic condition may gradually pass off, either when further local development takes place or when the defective condition becomes in some way compensated.

Other Cases of Anemia and General Debility

In all cases the cause or causes must, so far as possible, be determined and removed. Cases of anemia **from direct loss of blood** through surgical operations or accidents, after the first danger is over, and if there are no complications, usually tend to rapid recovery through rest and ordinary home treatment. Sometimes a change from town to country air is advisable, and sometimes a course of **chalybeate waters** at a pleasant inland health resort of moderate elevation, amidst beautiful hills and woods, such as SPA, in the Belgian Ardennes, and SCHWALBACH, in the Taunus Mountains, and PYRMONT, in the Principality of Waldeck, in northern Germany, may be substituted for pharmaceutic iron preparations. In cases of anemia due to **chronic purulent and mucopurulent discharges** the cause must, of course, be remedied by suitable local or other treatment if possible, but **chalybeate waters** or iron preparations are generally useful. In these cases climatic health

resorts and spas are often beneficial, and must be selected according to the constitution and individual peculiarities of the patient.

Anemia is often the result of **sluggish portal circulation and constipation**, associated with hemorrhoids and congestion of the pelvic organs. In these cases a fairly **bracing dry climate** often acts well, and the inland health resorts of moderate altitude may be selected. Seaside resorts and ocean voyages are generally to be avoided. **Mineral water health resorts** are useful; one of the sodium chlorid waters containing iron, such as KISSINGEN and HOMBURG, or one of the cold sulphated alkaline waters containing iron, such as some of the springs of TARASP, FRANZENSBAD, and ELSTER, are generally better than pure chalybeate waters, such as those of Spa and Schwalbach, or the iron sulphate and arsenic group, such as that of Levico. **Sulphur waters**, such as those at NENN-DORF, WEILBACH, and GREENBRIER WHITE SULPHUR, West Virginia, have a great reputation in anemia connected with hemorrhoidal hemorrhages and sluggish portal circulation, and not less so those waters that possess a combination of sulphur and sodium chlorid, like HARROGATE and LLANDRINDOD, RICHFIELD SPRINGS, New York, FRENCH LICK SPRINGS, Indiana, and BLUE LICK SPRINGS, Kentucky.

Some cases of anemia and general debility are the result of **acute and chronic diseases, neuralgia, mental worry, overwork, nerve shocks, sleeplessness, and inability to take food**. Some of these cases have already been considered under the head of Convalescence from Acute Diseases. Others will be considered further on under the head of Neurasthenia ('nervous debility'). Other cases are really due to the wearing-out of the vital functions, with or without appreciable structural changes in the organs, and this class will be considered further on under the heading of Old Age and Premature Senility. Other cases are associated with **chronic dyspepsia** and chronic gastro-intestinal disturbances,¹ and again others are associated with **tuberculosis, syphilis, renal affections, and chronic malaria**, or form part of the results of prolonged residence in tropic climates; their consideration must necessarily be

¹ These cases, as well as many of the other classes of anemia, may be more or less due to chronic toxic influences, such as abnormal fermentation in the alimentary tract or local purulent discharges connected with the teeth, etc. Such possible causes should be investigated in all cases of anemia.

combined with that of these morbid conditions. With the anemia and cachexia associated with cancer and other malignant tumors, Hodgkin's disease, leukocythemia, and with the terminal stages of many other affections we are not concerned in this place, nor shall we discuss the treatment of advanced cases of pernicious anemia.

General Debility.—Under this heading there still remain a number of cases in which the patients are neither distinctly anemic nor cachectic, nor are they neurasthenic in the sense that the debility affects the nervous system more than the other tissues of the body. Many of these patients belong to the class of originally weak constitutions, in which cold climates and any cold weather increases the disorder. Any attempt to 'feed them up' leads to digestive disturbances and increases the physician's difficulty. Preparations of iron and chalybeate mineral waters frequently cause headache and constipation, and 'strong' treatment of any kind generally fails. Even when there is no hereditary tendency and the condition has been acquired in adult life, the causes are frequently altogether obscure. Often the sleep is impaired, and mental depression and irritability—'irritable weakness'—are likely to be troublesome complications. The anorexia, general lassitude, and disinclination or absolute inability to take any exercise add to the difficulties of management. In all these cases prolonged persistent treatment is necessary, the confidence of the patient must be obtained, and the physician must not lose patience or hope. Much may be gained from a modified open-air cure with almost complete rest at a suitable inland resort of slight or moderate elevation, especially one in the midst of large forests, during summer, or at one of the warm seaside health resorts during winter. Simple thermal spas, like WILDBAD and SCHLANGENBAD, in Germany, and in the United States the HOT SPRINGS of VIRGINIA and NORTH CAROLINA, situated in beautiful woodland valleys, may often be recommended during summer. Massage or the modified Weir-Mitchell treatment is sometimes beneficial, and may be combined with an open-air régime. The diet and mental state of each patient must be considered individually. With gradual improvement the patient must be encouraged to take voluntary exercise, but a long period is likely to elapse before he can resume ordinary work.

Summer and Winter Health Resorts

The summer and winter health resorts most likely to be useful in the various cases of anemia have recently been considered by Sir H. Weber,¹ and the following remarks are based upon his summary :

Summer Resorts.—The choice lies principally between the sea-coast and more or less elevated localities, which, although of very different elevation, are often, for convenience, called ‘mountain resorts.’ This term excludes the low-lying inland places, most of which are not bracing enough for the anemic, although the cool forests surrounding some of them and the resulting freshness and purity of the air allow exceptions to the rule. The **seaside** often causes headache, biliousness, loss of appetite, languor, and sleeplessness, while the inland resorts of moderate elevation improve the appetite, the sleep, and the general energy. In a certain number of anemic patients, however, with fairly good resisting powers, yachting or residence at moderately bracing seaside resorts on the coasts of England, France, Germany, and the United States act beneficially. As recovery takes place in these cases warm sea-baths and, later on, in very favorable cases, ordinary sea-bathing may be employed.

Resorts of **high altitude**, of which there are many in the Alps, the Rocky Mountains, and the plateaus in the interior of Mexico are certainly useful in many of the milder cases of anemia, and the effect on the blood produced by mountain air has been definitely demonstrated by many observers. The reactive powers of the patients recommended to these climates should be fairly good. Arrangements should, generally, be made for an anemic patient to recline in the open air, on verandas, etc., during a large part of the day, and thus spend much more time in the open than he would under the old custom of almost limiting the time spent out-of-doors to that occupied by walking exercise. The resorts of high altitude in the Rocky Mountains and the Andes can be made use of by a similar class of patients whose homes are not too remote.

Still more useful than high altitude resorts, however, are the numerous localities of **slight and medium elevation** situated among wooded hills and mountains ; they suit a greater number of

¹ “Health Resorts and Waters for the Anemic,” “Practitioner,” London, 1897.

cases, are more numerous than high altitude resorts, and are found in almost every country. A discussion as to the relative merits of the individual health resorts in question is unnecessary here.

Winter Resorts.—The winter resorts of **high altitudes** can be employed only in exceptional cases, because the winter cold is well borne by but few anemics. The sheltered localities of the **WESTERN RIVIERA**, **ABBAZIA** on the Adriatic, the south of **SPAIN**, **ALGIERS**, the southern parts of **CALIFORNIA**, **FLORIDA**, the **EAST** and the **WEST INDIES**, offer better chances. Some of the warmer seaside resorts of Great Britain, Ireland, and western France, especially **BIARRITZ**, will likewise answer in certain cases, but, as has been previously stated, they are not generally to be selected in ordinary cases of chlorosis. Localities more or less removed from the seashore often act better than those in the immediate neighborhood of the sea. Among such are **GRASSE** and **CIMIEZ**, on the Riviera; **ARCACHON**; **GARDONE-RIVIERA** and **ARCO** near the Lago di Garda; **ROME** and **FLORENCE**; **HELOUAN**, **MENA HOUSE**, and **ASSOUAN** in Egypt. In the United States corresponding stations are found in **LAKEWOOD**, New Jersey, **AIKEN**, South Carolina, **AUGUSTA** and **THOMASVILLE**, Georgia, the interior resorts of **FLORIDA**, and **REDLANDS** and other stations in the interior valleys of California. As 'intermediate resorts' for autumn and spring, or even as places of residence for the whole winter, sunny places near the lake of Geneva, as **VEVEY**, **MONTREUX**, **LES AVANTS**, **GLION**, many places in the Swiss and Italian lake districts, as **LUGANO**, **LOCARNO**, **PALLANZA**, and southern slopes of the eastern Alps, as **MERAN**, **BOTZEN**, and **GOERZ**, can be recommended. **CASTELLAMMARE DI STABIA** and **SORRENTO** on the bay of Naples, **AMALFI** on the bay of Salerno, **LA CAVA** near Salerno, and the beautiful Sicilian resorts of **TAORMINA**, **PALERMO**, and **ACIREALE**, which, though near the seashore, are more or less elevated above sea-level, may sometimes be chosen also. Among similar resorts in the United States mention may be made of **OLD POINT COMFORT**, Virginia, **CORONADO**, **PASADENA**, and **SANTA BARBARA**, California, and **LAS VEGAS**, New Mexico. At the last-mentioned station the southern latitude overcomes the effect of the high altitude in lowering the temperature.

We have already referred to the use of spas with chalybeate

waters, arsenical waters, or muriated waters and baths in various classes of anemia ; but simple thermal spas are often more useful than any of these places, especially in the cases alluded to under the heading of General Debility, with or without obvious anemia. As good examples of simple thermal spas for such cases we need mention only GASTEIN, RAGATZ, TEPLITZ, SCHLANGENBAD, WILDBAD, and BUXTON in Derbyshire ; the pure air as well as the forests and other pleasant surroundings of such places doubtless play an important part in the treatment.

Persons in whom anemia is accompanied by considerable dilatation of the heart should not be sent either to the high elevations or to the immediate seashore, but to moderately elevated regions,—below 3000 feet,—with a fair amount of level or gently rising ground for exercise. These cases also are likely often to derive benefit from effervescent baths, such as the warm salt baths of NAUHEIM and OEYNHAUSEN. Anemic conditions following attacks of acute rheumatism can often be treated by these baths, but the results of acute rheumatism will be again referred to.

In conclusion we may repeat that arrangement of diet and exact rules as to exercise are of the greatest importance in every case of anemia, and neglect in respect to these matters is likely to render treatment by spas and climates of no avail. In anemic cases the weakness is often so great that any exertion, and consequently any journey to a health resort, must be injurious. In such cases no attempt should at first be made to remove the patient, but preparatory treatment, by complete rest in the open air and by being wheeled about in a bath-chair, can usually be carried out at home. The removal of such patients to health resorts should be delayed, often for weeks or months, until considerable improvement has set in and bad effects from the journey need no longer be feared.

In the United States one of the best nearby resorts for patients living in the vicinity of New York and Philadelphia is LAKEWOOD, New Jersey. It is ten miles distant from the ocean and almost at sea-level. Further south, the HOT SPRINGS of Virginia, AIKEN, in South Carolina, THOMASVILLE, in Georgia, and in the West, CORONADO in California, are suitable.

CHAPTER IV

THE USE OF HEALTH RESORTS IN CERTAIN DIATHESES AND TOXEMIAS

Rachitic and Weakly Children. Syphilis. Chronic Metallic Poisoning. Gout and Gouty Conditions.

RACHITIC AND WEAKLY CHILDREN

Such children should be reared in much the same way as children with a predisposition to scrofula and tuberculous affections. Though improper feeding more easily produces rickets in some children—*e. g.*, weakly children with a tendency to gastro-intestinal catarrh—than in others, the diet is the most important consideration in every case of rickets. **Dry, sunny inland** climates and **warm, sheltered, seaside** localities are the best places for this class of children. Warm brine baths and tepid baths, followed by cool affusions, can be recommended according to the reactive powers. Alkaline earthy chalybeate waters have been recommended for internal use in rickets, but their utility is doubtful.

SYPHILIS

Ordinary cases can be treated efficiently by the ordinary methods,—pharmaceutic preparations of mercury and potassium iodid by the mouth, mercurial inunctions and subcutaneous injections,—and neither climatic nor balneotherapeutic treatment is to be regarded as a substitute for mercury or for the iodid. At every stage of the disease, however, everything possible should be done to improve and maintain the general condition of the system. At home much can be done in this direction by limiting the amount of brain work, by avoiding mental worry, by suitable diet, by regular open-air exercise without fatigue, and by attention to the skin by means of baths, frictions, etc. Frequently, however, such precautions cannot

be properly observed while the patient is at home and attending to his work. For social reasons, moreover, the patient sometimes wishes to be away from home, mainly in order to escape from his friends and ordinary surroundings. In these cases a good health resort offers the following advantages: Freedom from the ordinary business and social cares of daily life; freedom from the special worry of remaining at home while suffering from a secondary eruption on the face and an infectious condition of the mouth and throat; good air, suitable exercise, and proper diet, without the necessity of hurrying through meals; special facilities for inunctions, baths, douches, and the care of the skin; and last, though not least, in many instances, supervision by medical men who have paid great attention to the subject. Thus it is that many health resorts have obtained a special reputation in the treatment of syphilis. Of these AACHEN (Aix-la-Chapelle), in Germany, is perhaps the most generally known, chiefly owing to the work and writings of the local physicians. The list of health resorts to which patients resort for syphilis is very large, and includes BAGNÈRES-DE-LUCHON and AX-LES-THERMES in the Pyrenees, URIAGE near Grenoble, AIX-LES-BAINS in Savoy, WIESBADEN in Germany, HOT SPRINGS, Arkansas, in the United States, and a great number of places with **thermal** and **sulphurous** and **common salt springs**. The baths at these places maintain the skin in good condition during treatment, and probably favor the excretion by the kidneys of the specific toxins of the disease. Internal courses of waters likewise help to flush out the body, and probably minimize the deposition of mercury in the tissues. It is possible, also, that sulphurous waters, when taken internally, may help to ward off mercurial enteritis, as suggested by Neisser, and that a course of sodium chlorid waters favors metabolic processes generally, and therefore also those undergone by the mercury in its passage through the body.

There is another point, however, on which we must lay special stress in regard to the action of health resorts in syphilis. Every one nowadays admits that tabes dorsalis and general paralysis of the insane seldom occur in persons who have not had syphilis; there is equally little doubt that a causal connection frequently exists between syphilis and localized inflammatory changes in the

arch of the aorta, which lead to aneurysms; between syphilis and precocious degenerative changes in the blood-vessels at the base of the brain and in the coronary arteries of the heart; and between syphilis and early fibrous changes in the viscera. It seems that the toxins of syphilis circulating in the blood may permanently lower the vitality of certain nervous and other tissues in such a way that overwork¹ and other harmful influences, though not sufficient to act injuriously in the case of ordinary persons, lead subsequently, in the case of a few of those who have had syphilis, to the occurrence of atrophic and fibrous changes in various organs. If these views² be correct, as we have every reason to believe they are, it is obviously of great importance during the active stages of syphilis—the primary and the secondary—to rid the body of the injurious toxins as quickly as possible after they are produced, and thus diminish the length of time during which they exercise their bad effects on the vitality of the various cells. This object is probably best accomplished by the eliminative action, to which we have just alluded, of hydrotherapeutic and balneotherapeutic methods employed during the early stages of the disease, in association with specific treatment. According to the same theories, an almost equally important indication is to protect syphilitics from overwork and mental worry. For certain patients this can be accomplished only by having them treated at some health resort during the active stages of the disease, and by advising them as to the danger of excessive bodily and mental strains and the value of regular holidays in suitable climates; they must understand that this advice applies not only to the period when they show obvious signs of the disease, but that the same hygienic mode of life must be continued for many years after every trace of the disease seems to have vanished, or even for the whole life.

¹ *Vide* the results obtained by Edinger and Helbing from their experiments as to the production of the spinal lesions of tabes dorsalis by forced muscular exercise in animals (German Medical Congress, 1898). See also the "Discussion on Tabes Dorsalis and General Paralysis, at the Pathological Society of London," November and December, 1899, "Transactions of the Pathological Society," 1900, vol. LI.

² F. P. Weber, "Der Nutzen von Bädern, Mineral-Wässern, und Kurorten in der Behandlung der Syphilis," "Abhandl. der 72. Versammlung Deutscher Naturforscher und Aerzte," Aachen, 1900, Abtheilung für Hautkrankheiten und Syphilis, p. 259.

Syphilitic Cachexia.—There may be a certain amount of disturbance of the general nutrition associated with syphilis in the earlier stages, but the severer forms of syphilitic cachexia mostly occur at late periods. The cachexia is often accompanied by obvious tertiary syphilitic lesions in the abdominal viscera and other parts of the body, but it may occur without other simultaneous indication of syphilis. In some cases of syphilitic cachexia the anemia may be excessive and the appearances in the blood may resemble those of pernicious anemia. The ordinary antisymphilitic treatment, by potassium iodid and mercury, may sometimes altogether fail, and these cases may, indeed, show themselves very resistant to any mode of treatment, pharmaceutic or otherwise. The hematopoietic functions seem to be affected either by the toxins of the disease or by a local syphilitic process affecting the marrow and cancellous tissue of the bones. Suitable climatic health resorts may be of use in such cases. During **summer**, simple thermal or thermal sulphur spas amidst cool woods and in beautiful broad mountain valleys may be tried. The elevation must depend upon individual indications. Ordinary hydrotherapeutic treatment, when judiciously managed, often has a most beneficial influence. Occasionally, also, iron and arsenic waters may be of use. The **winters** ought to be spent in warm, dry, sunny climates, such as the Riviera and Egypt, where the diminished powers of resistance toward cold are not overtaxed. The question of the simultaneous use of anti-symphilitic remedies must be specially considered in each patient. Some of the worst cases are too bad for removal to a health resort until a certain degree of improvement has taken place under home treatment. In every instance the utmost attention must be paid to the general hygienic management. Thus, at first, more or less complete **rest** is required, and this indication can be fulfilled by arranging a kind of **open-air treatment**, like that employed for pulmonary tuberculosis. The diet must always be carefully attended to. Improvement will generally be very slow, and the medical man must be careful to oppose a persistent hopefulness against the patient's tendency to despondency.

CHRONIC METALLIC POISONING

In cases of chronic metallic poisoning from mercury or lead there is no special indication in regard to climate excepting that whenever there is cachexia the climate should be one that makes no excessive demands on the patient's resisting powers. **Simple thermal waters** and weak **thermal sulphur waters**, used in the form of baths and douches, as well as suitable hydrotherapeutic treatment, may be serviceable in promoting the general nutrition and favoring the elimination of the metallic poisons from the body. Many of the spas possessing simple thermal waters and sulphur waters are beautifully situated, at moderate elevations above sea-level, and form delightful health resorts for summer. Mild internal courses of **sulphated alkaline waters**, such as those of CARLSBAD, and of other waters with a cholagogue or diuretic and laxative action, including waters containing sodium chlorid, such as those of HARROGATE, LLANDRINDOD, HOMBURG, KISSINGEN, and BOURBONNE-LES-BAINS, may also, like certain pharmaceutic preparations,—*e. g.*, potassium iodid,—assist in the removal of the poisons deposited in the liver and other parts of the body, by way of the liver, kidneys, and bowels. Warm, dry winter climates, such as that of EGYPT, would be useful in cases of chronic lead poisoning when the kidneys have become involved. In the United States, BEDFORD Water, and Congress, Hathorn, Crab Orchard, the Champion, Columbian, and Geyser Waters of SARATOGA,—in fact, nearly all the Saratoga Waters,—may be utilized in these conditions.

GOUT AND GOUTY CONDITIONS

In the case of gouty persons, regulation of the diet—that is, great moderation in food and stimulants—and the mode of living is the main matter to be considered; but climates and mineral water health resorts are often useful. As a rule, **dry inland health resorts** are more suitable than the seacoast and sea voyages. Sea air not rarely induces exacerbations of gouty affections, and it sometimes tends to bring on a condition of biliousness or constipation and drowsiness. It seems, in these cases, as though the appetite

and the first stages of the downward processes of metabolism were increased, while the functions of the organs concerned in the later stages of catabolism¹ and with the elimination of waste-products remain defective. Sir Dyce Duckworth, however, has seen benefit result from sea voyages in some cases, although the tendency to overeat and to take insufficient exercise is a disadvantage. In strumous gouty cases he recommends a stay at the seaside for some weeks in each summer, and in older patients and in asthenic forms of gout, he finds warm sea-water baths and douches of value.

Inland climates should be selected for gouty patients according to their **constitution** and **reactive powers**. Dry climates are better than moist ones. Sheltered resorts of high altitude are often useful in summer for the stronger class of patients without emphysema or cardiac affections. For less robust patients and those with a tendency to emphysema and cardiac dilatation resorts at moderate elevations with abundant opportunity for level or but slightly uphill walking should be preferred. In many weak gouty persons mere change of climate and traveling to interesting places are sufficient. By this means the mind and body of the patient are both kept active, without excessive strain being thrown on any of the functions. In old and debilitated persons, and those affected with arteriosclerosis, warm, dry, winter localities, such as EGYPT and the RIVIERA, must be chosen, especially when the kidneys are affected.

A course of treatment at **mineral water health resorts** during the warmer months of the year is frequently an advantage. Whether we hold that gout and gouty conditions are due to the excessive formation of uric acid and the so-called alloxuric bases, or of the latter substances only, or to deficient excretion of some or all of these substances by the kidneys, or partly to excessive formation and partly to deficient excretion, we can easily understand that baths and various hydrotherapeutic processes may be of great use by aiding in the elimination of waste-products from the body. In regard to internal courses of mineral waters, the sulphated and the sulphated alkaline waters exercise the best effect in robust consti-

¹ Bilioussness Sometimes Induced by Sea Air," by F. Parkes Weber, London, January 11, 1900.

tutions with a tendency to obesity and abdominal plethora. The sulphated alkaline waters, the simple alkaline waters, and the alkaline earthy waters—for instance, those of CONTREXÉVILLE—are recommended when there is a tendency to uric acid deposits in the urine; the sulphated alkaline group particularly in the plethoric cases. In weaker patients the muriated, muriated sulphurous, and simple thermal waters are of use. The muriated sulphurous and sulphurous spas, such as SCHINZNACH, URIAGE, HARROGATE, and others, have a reputation for benefiting gouty patients with a tendency to eczema; as have likewise some muriated alkaline spas, such as ROYAT and LA BOURBOULE.

Active exercise, according to the patient's state, is of the greatest use in all cases. It is quite obvious, indeed, that exercise in the open air is likely to be of the utmost value in a disease the symptoms of which are connected with defective processes of oxidation in the body. When sufficient exercise is impossible, massage may, to some extent, supply its place, but voluntary exercise increases the processes of oxidation in the muscles more than massage does, and, by increasing the respiratory movements, it brings about a gentle intermittent squeezing of the abdominal viscera, and thus doubtless favors the functional activity of the liver and intestines.

The best American resorts for the treatment of gout and allied affections are HOT SPRINGS, Virginia, HOT SPRINGS, North Carolina, LAS VEGAS HOT SPRINGS, New Mexico, KLAMATH HOT SPRINGS, California, and MUDLAVIA, near Attica, Indiana. At Las Vegas, Klamath, and Mudlavia, mud baths are employed with great success. Other mineral springs worthy of mention are those at BEDFORD, Pennsylvania, UKIAH and SANTA YSABEL, California, POLAND, Maine, RICHFIELD, New York, the 'Vichy Spring' at SARATOGA, New York, and BUFFALO LITHIA SPRINGS, Virginia. There are many other waters of value in the treatment of gout; some, such as those of GLEN SUMMIT and MINNEQUA, in Pennsylvania, depending, like the Poland water, on great purity and freedom of use; others, such as Londonderry lithia, Buffalo lithia, and Farmville lithia, depending in part on the contained salts, of which lithium compounds are the least important.

CHAPTER V

THE USE OF HEALTH RESORTS IN RHEUMATISM AND ALLIED AFFECTIONS

Articular Rheumatism. Gonorrheal Rheumatism and other Pseudorheumatic Affections of the Joints and Fasciæ. Chronic Rheumatoid Arthritis. Chronic or Progressive Arthritis Ossificans.

CONVALESCENCE FROM ARTICULAR RHEUMATISM

Rheumatism is a very vague term and is frequently used to include a number of different morbid conditions, some of which are probably of microbic origin, while others are the result of metabolic perversion, and still others of complex etiology. We shall not here enter upon pathologic or etiologic problems except incidentally. We have first to consider the treatment to be followed during convalescence from acute articular rheumatism (rheumatic fever). It may be said that the shorter the interval that has elapsed since an attack of the disease, and the younger the individual, the more easily may relapse or a fresh attack be brought on by imprudence. Exposure to cold, especially to damp cold, and to impure air may lead to an attack of follicular tonsillitis, followed by a return of acute articular or cardiac manifestations. Digestive disturbances due to dietetic errors may have a similar result. The heart may be affected without there being any distinct physical signs of heart disease, yet premature exertion may lead to yielding of the inflamed and softened cardiac valves and thus to permanent valvular disease. Sir R. Douglas Powell ¹ thinks that mitral stenosis and aortic regurgitation are valvular lesions that are rarely met with in the initial rheumatic illnesses, but that they are the consequence of subsequent slow deforming valvulitis from strain put upon the valves before they have completely recovered from the primary

¹ "Lancet," March 31, 1900, p. 922.

rheumatic lesion. S. Solis Cohen ¹ is of the opinion that the cardiac muscle as well is usually involved, and that chronic myopathy, with or without dilatation, may result from premature return to usual activity. All this makes it obvious that **prolonged rest**—that is, rest in bed—is of the first importance, not only during the active stages of the disease, but for a considerable period afterward. After sufficient time, however, has been allowed for this complete rest, a change of climate often is advisable before the patient is allowed to resume the ordinary mode of life. During **summer**, a dry, sheltered locality of moderate elevation, not too hot and not too cold, will be suitable, and during **winter** a warm, dry climate, such as the **WESTERN RIVIERA** or **EGYPT**. In the United States, **LAKEWOOD**, New Jersey, **HOT SPRINGS**, Virginia, **SANTA BARBARA**, and **REDLANDS**, California, are types of the winter resorts available in various sections of the country. If the convalescence is very slow, and if, in spite of prolonged rest, the heart remains weak and irritable, with or without valvular complications, a course of treatment by **thermal effervescent baths**, such as those of **NAUHEIM**, may be recommended; the treatment should be carried out in a suitable climate, either with baths of a natural effervescent mineral water or with an artificial substitute, but in every case under careful medical supervision. The patient may afterward stay at a climatic resort of the kind already referred to.

When, in regard to the general condition, recovery is good and the heart appears to be quite free from disease, but the joints remain more or less stiff and swollen, a course of treatment at **simple thermal spas** or at **brine spas** will generally do good, the baths being in some cases aided in their action by douches, massage, passive movements of joints, and Swedish gymnastics.

CHRONIC ARTICULAR RHEUMATISM AND THE RESULTS LEFT AFTER ACUTE ARTICULAR RHEUMATISM.

A great deal of what was formerly termed chronic articular rheumatism is now classed as chronic rheumatoid arthritis, and

¹ "Journal of the American Medical Association," January 12, 1901.

some cases belong to the 'pseudorheumatic' affections; yet there are cases left that from a pathologic point of view are probably of the same nature as acute rheumatism, although they are chronic instead of acute or subacute. Acute rheumatism is now generally supposed to be a specific infection or a group of specific infections, but until the causative organisms are identified the question of the pathologic unity of the chronic and the acute forms of the disease cannot finally be decided. The treatment will be similar to that of the chronic and convalescent stages of acute articular rheumatism, to which reference has been made in the preceding pages.

GONORRHEAL RHEUMATISM AND OTHER PSEUDORHEUMATIC AFFECTIONS OF THE JOINTS AND FASCIÆ

Gonorrheal rheumatism may be taken as the type of this group, but there are, doubtless, various septic processes in the body—for instance, nongonorrheal forms of urethritis—and toxic conditions of the blood that may induce similar disorders of the joints and fasciæ independently of gonorrhea. The exciting causes of the complaint must, of course, be treated by the ordinary methods. For the part that can be played by climates and health resorts in the removal of gonorrheal gleet, we must refer to our remarks under the heading Chronic Urethritis. Swelling, tenderness, and partial fixation, owing to inflammatory exudation about the joints and tendons, are likely to be more persistent in these affections than after acute rheumatism. Benefit may, therefore, be derived from a large number of health resorts where treatment can be obtained by a combination of mechanical and balneotherapeutic measures, such as thermal baths, douches, douche massage, massage, passive movements, Swedish gymnastics, and sometimes by the local application of hot muds, including the 'fango' of North Italian spas, and sand, or by local vapor baths, local hot-air baths, and local electric light ('radiant heat') baths. Climates similar to those recommended after acute rheumatism may be chosen.

CHRONIC RHEUMATOID ARTHRITIS

The vexed question of the pathology of rheumatoid arthritis, and whether it is connected with gout, will not be discussed here.

The term was first employed by Sir A. B. Garrod in 1858, but many other terms have been, and still are, employed to denote the same affection ; among these may be mentioned chronic rheumatic arthritis, rheumatic gout, arthritis or poly-arthritis deformans (Virchow), and osteo-arthritis (the favorite term among the surgeons of England). In regard to treatment, cases may be roughly—not sharply—divided into two groups : (1) A multiple affection of the joints, articular and peri-articular, more or less active, although generally chronic in character, and occurring in comparatively young and middle-aged persons ; (2) an affection generally occurring in debilitated old persons, less active and more atrophic in its manifestations. In old persons one of the larger joints is often singled out,—as, for instance, in senile hip-disease, ‘*morbus coxae senilis*,’—especially when some injury seems to have brought on the disease.

In the **first class** of cases, dry tonic climates of moderate elevation, where the soil is porous, dry, and well drained, are to be recommended for residence. During summer, health resorts where **thermal baths** (simple thermal, thermal sulphur, or thermal muriated waters) can be obtained are often useful ; of frequent use, also, is the local or general treatment by hot mud-baths, hot peat baths, hot vapor baths, and hot-air baths, electric light baths included.

In the **second class** of cases the treatment must, of course, be adapted to the senile or debilitated character of the patients. Simple **thermal spas** in pleasant mountain valleys may, however, be useful, and occasionally an internal course of muriated or muriated alkaline mineral waters may be recommended. When the affection is limited almost to one joint, local hot vapor and hot-air baths can be employed. In **winter**, warm, sunny, dry localities should be selected, owing to the limited powers of resistance to cold in this class of patients. **Sea voyages** in warm climates, such as in the **MEDITERRANEAN** or to the **WEST INDIES**, are sometimes to be preferred when a patient's inclinations lie in this direction. The arrangement of a simple but nourishing diet is required, according to individual indications. The effects of mere change of locality, etc., will be referred to again when we consider the climatic treatment of old age.

CHRONIC OR PROGRESSIVE ARTHRITIS OSSIFICANS

Arthritis ossificans has been much discussed during the last years, and has some claim to be regarded as a distinct affection. When the vertebral column only is affected, the disease is often spoken of as spondylitis deformans (chronic ossifying spondylitis) or rheumatoid arthritis of the vertebral column, but it differs considerably from ordinary rheumatoid arthritis. The French—that is, Pierre Marie—have termed the disease ‘Spondylose Rhizomélisque,’ and it may sometimes progress to almost universal bony ankylosis. The treatment of this affection is as uncertain as is its etiology, but the course of the malady is probably not invariably a progressive one, as some of the names invented for it would seem to imply. A simple nourishing diet combined with courses of hot baths or douche massage, such as may be obtained at AIX-LES-BAINS, BATH, WIESBADEN, BADEN-BADEN, HOT SPRINGS, Virginia, HOT SPRINGS, Arkansas, KLAMATH HOT SPRINGS, California, LAS VEGAS HOT SPRINGS, New Mexico, and other spas, and winter residence in warm, dry localities, would seem to offer the best chances for recovery.

CHAPTER VI

SOME DISORDERS OF METABOLISM

Obesity. Diabetes Mellitus and Glycosuria—the Grave Forms ; the Mild Forms.

OBESITY

In the treatment of obesity climate is not very important. It must not be supposed that all corpulent persons eat excessively and are particularly lazy ; individual peculiarities in the metabolic processes, often hereditary, play a very important part in the production of obesity ; some persons remain relatively thin however much they eat and however little exercise they take, whereas in others 'all the food they take seems to turn into fat.' Nevertheless the main treatment of obesity resolves itself into a question of diet and exercise. The aim of dietetic treatment must be to reduce the amount of fat-forming foods so as to make the body burn up its superfluous fat without being unduly weakened by excessive oxidation of its proteid components—that is to say, the catabolism in the fatty tissues of the body must be excessive, while an equilibrium of income and output in regard to the nitrogenous metabolism is maintained. The various questions of diet cannot, however, be discussed here.

The climate should be one of a fairly cold, bracing nature, so that, owing to the necessity for increased heat-production, the metabolic processes are increased, and, also, that an increased mental inclination for bodily exercise is induced. In most cases, if the heart is not affected, bracing inland resorts of high elevation are better than sea air and ocean voyages. Mineral water health resorts may aid the dietetic treatment in some cases. In regard to the action of mineral waters and baths in these cases it must be remembered that the removal of a large amount of the patient's fat is not the only object to be aimed at : his general health must be main-

tained while the reduction of fat is being effected by diet, exercise, and other means. Even when the patient's weight cannot be much or quickly reduced, it is most important to keep his organs in a state of healthy activity, for the accumulation of fat impairs the action of the heart and the movements of respiration, and favors sluggishness generally. Sulphated and sulphated alkaline waters taken internally may be useful by their action on the bowels and by their diuretic effect. MARIENBAD has a reputation in cases of obesity, especially good, partly due, doubtless, to the attention paid by the local physicians to diet and general regimen. Hot-air and vapor baths, by their action on the skin, have a powerful eliminative effect, and have a tendency to render some stout persons healthier and more inclined to be active and to take exercise. Cold hydrotherapeutic treatment, combined or not with hot-air baths, is useful by increasing the processes of metabolism in the body. In this connection it is interesting to note that the reaction consequent on general cold hydrotherapeutic procedures is accompanied, as Winternitz and his pupils, Strasser and Wertheimer, have shown, by a temporary (mechanical) increase in the red and white cells and in the specific gravity of the circulating blood, great numbers of cells that were stagnating in the abdominal viscera and elsewhere being washed out by the blood stream into the general circulation. One of the immediate results of cold-water treatment is, therefore, that the tissues are supplied with blood containing more hemoglobin and more oxygen, and in this way, as long, at least, as the period of reaction lasts, processes of oxidation are specially favored. The same may, of course, be said in regard to active muscular exercise, abdominal massage, and other procedures that temporarily increase the proportion of red cells in the circulating blood. Thermal effervescent baths may be employed when there is a tendency to cardiac weakness. The iron contained in some sulphated alkaline and muriated waters serves to counteract anemia when this complicates obesity.

It must not be forgotten that the accumulation of fat may, in some persons, follow severe illnesses, such as typhoid fever, or severe mental shocks and prolonged worry. In some of these cases the obesity is only temporary, and disappears with the improvement

of the general health, which may be furthered by climatic and balneotherapeutic treatment, according to individual indications. In conclusion, reference should be made to the value of pure air and sunlight as obtained at good health resorts, when combined with suitable exercise, etc., in promoting oxidation in the tissues and thus helping to burn up superfluous fat.

DIABETES MELLITUS AND GLYCOSURIA

For present purposes diabetes mellitus may be divided into two classes: (1) The **grave forms** of diabetes, which occur especially in young persons, and generally run a progressive, often a rapid, downward course; the acute forms are associated with the passage of large quantities of urine of high specific gravity and considerable percentage of sugar, excessive thirst, dryness of the skin, and emaciation; (2) the so-called **benign forms**, occurring in gouty or stout persons, mostly well advanced in the second half of life. No hard-and-fast line, however, separates these two classes from each other. Cases of benign diabetes, apparently nonprogressive in character, may, under the influence of mental worry, overwork, and improper diet be transformed suddenly into very grave cases; temporary cases of slight glycosuria, due to alimentary errors or to nerve shocks, and the like, may later become well-marked cases of diabetes mellitus. It is unnecessary to discuss here which cases of temporary glycosuria due to alimentary and other causes should be regarded as very slight or commencing forms of true diabetes and which should be termed examples of 'nondiabetic glycosuria.' The mere question of the term to be employed does not affect the prognosis or treatment of the case.

Theoretically, of course, all cases in which sugar appears in the urine may be divided into various pathologic groups, accordingly as the pancreas, the liver, the nervous system, and other organs are believed to be at fault, whether structurally or merely functionally. In some cases, it is true, this classification may be of use in regard to prognosis or treatment—for instance, when it is recognized that the glycosuria is dependent on an injury to the brain or on a pancreatic concretion; but clinically, cases in which such diagnoses can

be made are rare. Much, however, that is of practical importance in regard to treatment and prognosis can be ascertained by clinical observation. For instance, it may be determined whether, with a suitable diet, sugar readily disappears from the urine, or whether the sugar is usually absent from the urine and appears there only under exceptional circumstances,—for instance, when excess of carbohydrates is taken as food (alimentary glycosuria),—or whether dietetic treatment fails to free the urine of sugar; by clinical observation one may discover what special articles of diet and what quantities of them cause sugar to appear in the urine or increase the quantity of sugar passed, and whether the patient is affected, in addition, with maladies other than diabetes, such as renal disease, gout, or pulmonary tuberculosis, that may bear either a causative or a sequential relation to it, or be merely coincident.

Grave Cases

There is no special climatic indication for grave cases of diabetes in young persons, excepting that the climate must not be one that makes excessive demands upon the patient's powers of reaction. Holidays and a change of air are often advisable, however, and for this purpose suitable climates should be chosen according to the season of the year and other circumstances: thus a visit to the RIVIERA may be made during winter, and one to some quiet and beautiful mountain valley of moderate elevation during summer. Among winter resorts in the United States those of the warmer coasts, as FLORIDA or SOUTHERN CALIFORNIA, are to be preferred; but OLD POINT COMFORT, AIKEN, ATLANTIC CITY, LAKEWOOD, and HAMMONTON may also be cited as examples of places suitable in individual instances. It is in this class of cases that overexertion, including fatiguing railway journeys and exhausting mental work, excessive excitement, and shocks should especially be avoided, as being frequent causes of a fatal termination by diabetic coma. All sources of anxiety ought to be removed and cheering influences promoted.

In some of these cases a visit to a summer health resort may usefully be combined with a sojourn at some private sanatorium, where the metabolic failings can be investigated thoroughly and the

diet that is most suitable for the patient at the period of the disease in question be ascertained ; in this way, moreover, the habit of eating the right kind of foods can be acquired. In the United States several such sanatoriums exist, notably in the States of New York, Pennsylvania, and Michigan.

Mild Cases

In the more chronic and benign forms of diabetes, likewise, a stay in a **sanatorium** at some health resort is useful for the same purpose as in the grave forms. The management of diet, the attention to muscular exercise, and the regimen in general must be attended to wherever the patient is, and it is doubtless partly owing to the attention paid to these points that certain mineral water health resorts such as **VICHY**, **NEUENAH**R, and **CARLSBAD** have obtained their reputation. 'Benign' cases of diabetes are often, as has already been observed, made worse by mental overwork, worry, and nervous shocks. Exacerbations of this kind can often be avoided by changes of climate and mental relaxation if adopted at the proper time, and the intensification of symptoms often subsides rapidly under suitable diet when mental worry or other cause of the exacerbation has been removed. It is for this reason that a **long sea voyage**, with the resulting freedom from business worries and other cares, is likely to be useful ; a voyage is the easiest method by which letter-writing and ordinary correspondence can be reduced to a minimum. Frequent changes of climate and locality have likewise a very beneficial mental effect on some persons, and may be recommended, provided that a suitable diet can be obtained. Thus, visits to famous towns of historic or artistic interest are often useful ; but fatigue in traveling should be avoided in all cases. The climates selected for a visit must depend upon the season of the year and individual indications. During **summer** the bracing effect of elevated mountain and forest regions is often to be preferred, and dry, warm, sunny localities may be visited during winter. Thus, during **winter**, Europeans may spend their time in leisurely yachting in the **MEDITERRANEAN**, or they may stay at one of the health resorts on the **RIVIERA** or in **SICILY** ; they may visit **ROME**, **GREECE**, or **EGYPT**, and, in the last instance, make a voyage up the Nile. A well-

arranged visit to INDIA is likewise often beneficial. For Americans the cruises to MEDITERRANEAN ports, and from San Francisco to HAWAII, or TAHITI, or even to JAPAN, referred to in the chapter on Ocean Voyages (Book I, pp. 73 *et seq.*), are likewise to be recommended. For those who do not wish to cross the Atlantic, the waters of the GULF OF MEXICO and the CARIBBEAN SEA, or for residents of the PACIFIC COAST, the warmer waters of that region, are available. It must, however, be added that many glycosuric patients with sound circulatory systems derive most benefit also during winter from mountain climates and the active habits developed there.

In our second class of cases a course at a **mineral water health resort** during summer is sometimes useful. The special water chosen must depend upon the constitution of the patient; whether he has a gouty tendency or a predisposition to piles and abdominal plethora; whether he has been accustomed to excessive indulgence in food and drink; and whether he is spare in body or inclined to obesity. In cases of 'gouty glycosuria' and in corpulent persons, attacks of uric acid gravel sometimes alternate with the glycosuria, and a small quantity of albumin is not infrequently present in the urine. For these patients health resorts with sulphated alkaline and simple alkaline waters may be recommended. Among the best known are CARLSBAD, BRIDES-LES-BAINS, VICHY, and NEUENAHN; CONTREXÉVILLE is frequently recommended in France; and in Great Britain the muriated sulphurous waters of HARROGATE and LLANDRINDOD. It is in the 'benign' forms of diabetes and those in which the sugar readily disappears from the urine under antidiabetic diet that muscular exercise is especially indicated, partly in order to aid in 'burning up' the sugar. Massage and Swedish gymnastics may accompany spa treatment when sufficient ordinary exercise is not taken owing to corpulence or disinclination. For weak and for spare persons simple **thermal baths**, such as can be obtained at many resorts of moderate elevation,—*e.g.*, GASTEIN, WILDBAD, BUXTON, SCHLANGENBAD, and RAGATZ,—are beneficial; as may be the baths at HOT SPRINGS and HEALING SPRINGS, Virginia. The **internal use** of muriated alkaline or simple alkaline waters, as those of VICHY, NEUENAHN, OBER-SALZBRUNN, ROYAT, and LA BOURBOULE, in association with thermal baths or alone, may often be advised.

CHAPTER VII

CHRONIC MALARIAL AFFECTIONS AND CACHECTIC CONDITIONS FROM LONG RESIDENCE IN HOT CLIMATES

Chronic Malarial Affections. Malarial and Tropical Anemia.

CHRONIC MALARIAL AFFECTIONS

Climatic health resorts are frequently of use for persons returning from hot countries, whose health has been impaired through malaria and other microbic affections, or merely through the enervating effects of long residence in tropic countries, combined with an unsuitable diet and mode of life. In patients suffering from chronic malaria, exposure to damp cold and strong winds will frequently bring on exacerbations of the disease even in nonmalarious countries. In such cases, when the powers of reaction are good, a prolonged residence away from malarious districts, at resorts of high altitude, especially in the neighborhood of glaciers, generally gives satisfactory results. Quinin and arsenic must often be employed, however, in addition to the climatic treatment.

For most of the disordered states of health that result from malaria and prolonged residence in tropic countries CARLSBAD, in Bohemia, enjoys a special reputation among medical men who have practised in India and other hot climates. Courses of treatment at this spa are much employed in malarial cases complicated with enlargement of the spleen and liver, and the results on the general health of the patient are generally satisfactory, even when no distinct decrease in the size of the enlarged viscera can be made out after treatment. The muriated sulphated waters of BRIDES-LES-BAINS, in Savoy, and the sulphated alkaline waters of TARASP, in the Lower Engadine, and FRANZENBAD, in Bohemia, may be employed in the same way as those of Carlsbad, and all three places have invigorating climates. In delicate patients, simple thermal spas, such

as GASTEIN, in Switzerland, WILDBAD, in the Wurtemberg Black Forest, and PLOMBIÈRES, in the Vosges Mountains of France, may be recommended instead of strongly mineralized waters; and, in Great Britain, BUXTON, in England, and STRATHPEFFER, in Scotland, are spas that may be utilized for treatment. Sea air does not suit in all cases, but there are some inland localities in Great Britain at moderate elevations above sea-level, such as the neighborhood of HINDHEAD, in Surrey, and BRAEMAR, in Scotland, that are good summer resorts when baths and mineral waters are not required.

In conditions of **malarial and tropic anemia** without special complications in the abdominal viscera the **high altitude resorts** of St. MORITZ and CERESOLE REALE, with their chalybeate waters, can be recommended for summer. Simple **thermal spas in mountain valleys**, such as WILDBAD-GASTEIN, in the Duchy of Salzburg, and MONT-DORE, in the Auvergne Mountains, the waters of which contain a little arsenic, may be recommended when there are muscular and neuralgic pains. Other spas in mountain valleys with waters containing arsenic, such as LA BOURBOULE and TARASP, near which are the chalybeate and arsenical waters of Val Sinestra, are suitable for a stay in summer. In winter the warm dry climate of the RIVIERA or the sunny mountain slopes near the lake of Geneva, especially LES AVANTS, GLION, and CAUX, offer advantages in many cases.

In America there are innumerable resorts that may be utilized in the classes of cases under consideration; in the East, among the various branches of the APPALACHIAN mountain system from the CAROLINAS to CANADA; in the West among the ROCKIES; and the COAST RANGE of the Pacific seaboard. Especially available are the **thermal, sulphur, and chalybeate spas** of the VIRGINIAS and of CALIFORNIA. For suitable cases, CAPE BRETON and the **seaside** resorts of NEW ENGLAND may be advised in summer, and those of VIRGINIA and of SOUTHERN CALIFORNIA in winter; but New Jersey and the gulf coast must be avoided.

CHAPTER VIII

THE INFLUENCE OF CLIMATE IN THE VARIOUS PERIODS OF LIFE

The Climacteric Period in Women. Old Age and Premature Old Age.

THE CLIMACTERIC PERIOD IN WOMEN

There are climacteric periods in the life of some men, as well as of some women, that may give rise to anxiety. In persons of both sexes the period of commencing puberty is occasionally associated with functional disturbances of the nervous and circulatory systems. It is, however, the period of menopause in women that is most likely to be associated with mental or bodily disorders, although, doubtless, much more is popularly attributed to 'change of life' than justly should be. Mental disturbances of this period can often be avoided by judicious occupation of the mind, and, in some cases, the diversion of travel or of a visit to some health resort or interesting town may serve this purpose. When there is a tendency to digestive disturbance and to disorders of the general metabolism and of the organs of circulation, attention must be paid to diet and muscular exercise, while a course of spa treatment may sometimes be useful. In most cases the diet must be unstimulating, easily digested, and not too nitrogenous, especially when the menopause arrives suddenly and prematurely in women with a tendency to corpulence. When there is a predisposition to plethora, obesity, and fatty infiltration of the heart, a course of treatment at some spa with sulphated alkaline waters, such as FRANZENSBAD and MARIENBAD in Bohemia, TARASP, in the Lower Engadine, and ELSTER, in Saxony, may be useful. In weaker patients, spas with muriated or simple thermal waters may be selected, for a course of baths, for the internal use of the waters, or for both combined. Winter resorts should be selected in this class of cases according to the reactive powers of the individual.

OLD AGE AND PREMATURE OLD AGE

OLD AGE

Old age has by some ¹ been classed as a disease, and this classification is convenient from a climatotherapeutic point of view.

In old age the functional activity of the different organs of the body becomes lowered, although the deterioration is often more evident in one system than in others. Circulatory and digestive disorders, pulmonary emphysema, anemia, and an atrophic condition of the skin, with pruritus—'senile prurigo'—may all be manifestations of senility. The ordinary quantity of food and stimulants can often no longer be taken without risk of disturbance; bodily and mental work, which formerly stimulated the energies, produces fatigue; and cold weather, which formerly raised the appetite and the desire for exercise, is in old age likely to give rise to catarrhs, attacks of bronchitis, various forms of gout and rheumatism, and neuralgia or muscular pains. Diet and exercise must be regulated in accordance with the weaker powers of the digestive, muscular, and circulatory systems; and, owing to the diminished power of heat-production and increased tendency to bronchitis, extreme cold should be avoided. **Sunny and warm climates** during winter, autumn, and spring are therefore often needed. Among such may be mentioned CANNES, NICE, MENTONE, SAN REMO, and other RIVIERA resorts; ALGIERS, PALERMO, ACIREALE, and other places in SICILY; NAPLES, SORRENTO, AMALFI, and CASTELLAMARE-DI-STABIA, especially in autumn, in Southern Italy; LOCARNO, PALLANZA, and similar stations, on the Italian lakes; the neighborhood of MONTREUX, on the lake of Geneva; MERAN, in South Tirol.

To ward off decay as long as possible the functions of the different systems must be kept in gentle exercise. During **summer** the simple **thermal spas**, especially those situated at fairly high elevations, are serviceable by promoting the circulation in the skin and counteracting a tendency to senile pruritus, and, especially when combined with Swedish gymnastics, gentle climbing exercises, respiratory exercises, or massage, by maintaining the functions of

¹ "Galen de Sanitate Tuenda Liber Primus," caput v.

the circulatory and respiratory systems and the voluntary muscles. Among spas that have become celebrated as resorts of aged statesmen and princes, EMS and GASTEIN were repeatedly visited by the German Emperor William the First, and WILDBAD, by Prince Gortschakoff. Among warm winter resorts, CANNES owed its earliest popularity to the famous English statesman, Lord Brougham.

The functions of the mind must be attended to in old persons just as much as those of the body, and visits to health resorts owe some of their beneficial influence in the case of the aged to the stimulating effects on the mind of the change of scenery and surroundings. Sea voyages and easy traveling with agreeable companions may have the same effect, and so may a residence in towns that are rich in objects of artistic and historic interest, such as ROME, FLORENCE, NAPLES, and VENICE. At suitable seasons of the year a visit to the more northern towns, such as DRESDEN, MUNICH, PARIS, BERLIN, and LONDON, with their famous museums and picture galleries, may be suggested as a change.

For persons in advanced life so much depends on the surroundings, the food, and the character of the occupants of particular houses that climatic influences may very often be greatly enhanced or nullified by environment. Among American resorts that are suitable in winter are ATLANTIC CITY, OLD POINT COMFORT, PINEHURST in North Carolina, AIKEN and CAMDEN in South Carolina, THOMASVILLE and AUGUSTA in Georgia, and almost any of the better known resorts in FLORIDA. COLORADO SPRINGS and DENVER, Colorado, are often perfectly agreeable and delightful to the aged, and in CALIFORNIA any portion of the southern coast and orange belt may be desirable. In summer the NEW ENGLAND COAST abounds in delightful resorts, and the White Mountains, particularly BETHLEHEM, WAUMBEC, MAPLEWOOD, PROFILE, SUGAR HILL, and NORTH WOODSTOCK, are choice locations, full of interest, with good air and water and inspiring scenery. In New York State, SARATOGA, LAKE GEORGE, RICHFIELD, PAUL SMITH'S, LAKE PLACID, and KEENE VALLEY, ELIZABETHTOWN and WESTPORT in the Adirondack Mountains are all well suited to the entertainment of elderly persons. LAKE MOHONK and MINNEWASKA, near New Paltz, New

York, are among the best resorts for these guests. The Catskill Mountains are also to be recommended, but care should be exercised in the choice of a particular house. In Pennsylvania may be mentioned GLEN SUMMIT, WERNERSVILLE, MT. POCONO, KANE, in the northern part, and BEDFORD in the southern part, of the State. The region of the Great Lakes and the extreme eastern coast of Maine are not so desirable as the localities mentioned. The climate of CAPE COD, NANTUCKET, and LONG ISLAND is especially suited for the aged. Nantucket is noted for the longevity of its inhabitants. NEWPORT, Rhode Island, is also well adapted for persons of advancing years. It is the climate and not the mode of life prevailing at Newport that makes it desirable for this class. SOUTHERN CALIFORNIA and the mountains of VIRGINIA and WEST VIRGINIA contain many excellent resorts both for summer and winter, and most of the cities of the South and Southwest, as BALTIMORE, WASHINGTON, RICHMOND, LOUISVILLE, CHARLESTON, SAVANNAH, NEW ORLEANS, and their suburbs, are suitable for more or less prolonged winter visits.

PREMATURE SENILITY

Premature senility may be treated on the same principles as govern the treatment of old age. It tends to manifest itself in special structures, systems, or functions of the body more than does actual old age ; this tendency to early localized decay may be hereditary, and may be recognized long before there is evidence of old age in the remainder of the body. In these cases preventive measures, when begun early, may be useful ; for instance, by regular exercise and attention to diet a tendency to premature decay in the circulatory system can doubtless often be more or less counteracted.

CHAPTER IX

TUBERCULOSIS AND TUBERCULOUS AFFECTIONS

Pulmonary Tuberculosis. The Selection of Climates. High Altitudes. Sea Voyages. The Desert Climate of Egypt. Mineral Water Health Resorts. Sanatoriums. Scrofula and Chronic Tuberculous Affections other than Pulmonary Tuberculosis.

PULMONARY TUBERCULOSIS

This subject has already been referred to when discussing the effects of sanatorium treatment, ocean voyages, climates of high altitude, desert climates, etc. It is now generally admitted that the most satisfactory treatment of pulmonary tuberculosis is that by fresh air, proper feeding, general hygiene, including the wise use of water, with proper alternation of both rest ¹ and exercise, and careful attention to individual indications, such as in many cases can best be carried out under the personal supervision of the physician in a sanatorium. The proportion of recoveries under such treatment in the cases of patients sufficiently well-to-do to be able to procure at their own homes the necessary comforts and attention is likewise steadily increasing, so that the statement of the editor of this series, "Tuberculosis is curable," ² has already been justified by the event.

Although home treatment of this affection is gaining in favor, climate and health resorts still hold an important place in its management.

At one time, tuberculosis and other forms of chronic disease of the respiratory organs were almost the sole objects of treatment by climate. Aretæus and Celsus recommended sea voyages and a residence at the seaside in phthisis ; Galen recommended hilly districts combined with the use of milk ; Galen speaks of Stabiæ (Castellamare-di-Stabia), and Cassiodorus mentions Mons Lactis (probably

¹ *Vide* S. Solis Cohen's article, "Tuberculosis," in Hare's "System of Therapeutics," first edition, Philadelphia, 1891, vol. 1, pp. 736 and 773.

² *Ibid.*, p. 715.

Lettere), near Stabiæ, as resorts for phthisical patients. The elder Pliny thought that consumptives would be benefited more by residing in pine woods than by a sea voyage to Egypt or by the milk treatment in the hills.

Pure air is essential for the treatment of pulmonary tuberculosis, and although the general hygienic principles of the sanatorium treatment are those now agreed on, the most favorable climate that can be obtained under the circumstances should always be chosen for carrying out this treatment. In the preventive treatment of consumption also the question of climate, or, still more frequently, of climate in connection with occupation, has to be considered. Moreover, many persons, in spite of the modern tendency of medical opinion, altogether refuse to be treated in a sanatorium; they have a horror of such institutions, regarding them as little better than prisons. Such persons, if they can afford the expense, must in most cases be treated at health resorts with as much supervision as possible from the local physician. Health resorts are, moreover, often of great service in the treatment of various morbid conditions arising in chronic, quiescent, or arrested cases of pulmonary tuberculosis. It is important to exercise wise discrimination in the choice of a locality for the individual patient. In the United States, much harm has resulted from routine advice to 'go to Florida,' or, more recently, 'to Colorado,' in all sorts of men and conditions of cases.

Following are some principles laid down by Sir H. Weber ¹ for the selection of different climates in cases of pulmonary tuberculosis.

THE SELECTION OF CLIMATES

In every case the constitution—that is to say, the general strength and the reactive peculiarities—of the individual must be considered. The family history often helps us to decide whether the patient is of an originally strong or an originally weak constitution, although the effects of the disease and of temporary unfavorable circumstances may often render a decision difficult. If the patient belongs to a

¹ See especially his address before the International Tuberculosis Congress, held at Berlin in 1899, "British Medical Journal," June 3, 1899.

long-lived family, he probably possesses an originally strong constitution, even if several relatives have died of tuberculosis. In short-lived families, on the other hand, even if there is no history of tuberculosis, the members may be supposed to have an originally weak constitution. In pulmonary tuberculosis, as in many other diseases, a family tendency to longevity or the reverse is of the greatest importance both in regard to prognosis and treatment. In regard to treatment, the personal history often helps us in estimating the patient's power of resistance. Those persons who have always felt better, more capable of work, etc., in warm weather, but in cold weather lose their appetite, flesh, and energy for work, generally belong to the class of originally weak constitutions with less power of resistance, whereas those who have felt better in cold weather have stronger constitutions and greater power of resistance. Patients who from childhood onward have always had high fever with every slight illness, and have recovered with difficulty, and who always have moist hands are generally to be classed among the weak and erethistic constitutions. This conclusion is frequently confirmed by the color of the skin, the shape of the face, the general configuration of the body, the presence of an irritable cough, the weak action of the heart, and the tendency of the pulse to be influenced by the least exertion.

If the patient has a **weak constitution**, cold climates must usually be avoided, and caution is to be observed in recommending high altitudes and prolonged ocean voyages; whereas warm, sunny, and sheltered winter resorts, such as BEAULIEU and MENTONE, on the Riviera, PAU, and sometimes the more humid localities, such as MADEIRA, are frequently serviceable. When the patient has an originally **strong constitution**, mountain climates and extended sea voyages are to be preferred. Much can often be done, however, merely by keeping such patients in the open air, by feeding them well, and enabling them to take a suitable amount of exercise.

Certain clinical features of the disease must be considered in connection with the indications that they afford for treatment, but, needless to say, the patient's constitution and individual resisting powers must always be taken into account likewise.

In cases of **limited disease at one or both apices, without**

fever or with only slight fever, almost all climates can be utilized. High altitudes and sea voyages are to be preferred if the constitution is an originally strong one. Sanatorium treatment should generally be obtained, if possible in combination with a mountain climate.

When the reactive powers are good, cold regions and those with moderate changes of weather are to be preferred as stimulating vital resistance and recuperation. In certain cases of this class when the patient is a male and enjoys life at sea, and when, though his constitution was originally fairly strong, he has become infected with tuberculosis during temporary weakness from overwork, mental worry, improper hygienic conditions, or acute diseases, extended sea voyages are to be preferred to all other methods of treatment. The voyage should in general be directed to a region where the patient may remain for some time under favorable conditions, in order to make recovery complete; from which he may seek places calling for and calling forth progressively greater resistance.

Cases with limited local disease must be, first of all,—that is, during the very acute stage,—treated at the patients' homes or in the neighborhood of their homes. After subsidence of acute symptoms each case must be dealt with on its individual indications.

Patients with **extensive disease of one lung or of both lungs, without fever** or with only slight fever, are more difficult to advise. In the majority of these cases treatment at but a moderate elevation or at warm seaside localities deserves the preference. In the editor's experience the seashore, however, is to be avoided, as a rule, during active softening or in the presence of laryngeal ulceration. In some such cases, if the patient is fond of the life at sea, long voyages do good by improving the general health.

In **advanced disease with hectic fever**, prolonged journeys should be avoided, and, if possible, neighboring health resorts, together with careful supervision, should be recommended.

When there is much **laryngeal or intestinal ulceration** or any chronic form of diarrhea, no journey of any length should be undertaken. In regard to laryngeal complications, it may be mentioned that, contrary to older views, G. Derscheid ¹ has apparently

¹ "Tuberculose Laryngée et Altitude," 1897.

shown, from a statistical examination of Dr. L. Spengler's practice at Davos, that laryngeal tuberculosis in itself does not constitute a counterindication to treatment in high altitudes. On this subject Dr. S. Edwin Solly,¹ of Colorado Springs, concludes "that while tubercular laryngitis is always a grave complication, at an altitude as elsewhere, and that when advanced it is almost invariably fatal, yet in the earlier and medium cases, high altitudes, with appropriate treatment, afford relatively, though not actually, as good a chance for arrest or delay in laryngeal as in pulmonary tuberculosis." Of course, the dry atmosphere of high altitudes and all very dry climates, even in the absence of dust, increases pharyngeal and laryngeal irritability, but in laryngeal tuberculosis the question really depends on the general condition of the patient and on other complications of the laryngeal and pulmonary disease, and largely on the opportunity afforded at the health resort in question for skilled local treatment of the larynx. It must be remembered that in many cases of laryngeal tuberculosis the rapid advance of the disease in the lungs and larynx has already rendered the prognosis extremely unfavorable and made it undesirable to move the patient far from home.

In the United States the same climates that afford relief in pulmonary tuberculosis do not always favor a cure of the laryngeal form. As a rule, the patient should avoid high altitudes, seeking the low, dry, warmer regions. The milder southern stations somewhat removed from the seaboard are to be preferred. The stimulating northern resorts are not favorable, excepting in the warmest portion of the year. In Arizona, New Mexico, and Colorado dust storms are likely to occur, and the alkaline nature of the soil often aggravates laryngeal disease. A great difference of opinion exists regarding the climatic treatment of tuberculous laryngitis, and it is, no doubt, true that cases of pulmonary tuberculosis will be generally benefited by a residence in the States mentioned in spite of dust that may irritate a sensitive larynx. There are localities in Colorado—for example, Estes Park and the neighboring parks—where the winds are not so violent as elsewhere

¹ "Handbook of Medical Climatology," 1897, p. 149.

in the State and not so laden with dust. Physicians in Colorado do not believe that high altitudes are any counterindication, and they report a majority of patients cured of laryngeal tuberculosis or in whom the disease has become stationary. Active ulceration in the larynx or lung is a positive counterindication to residence on the Atlantic seaboard of the United States, however it may be elsewhere.

In progressive tuberculosis with scattered foci in both lungs and with much fever, sheltered localities near the patient's home, or the home itself, are probably the best places. S. Solis Cohen ¹ insists that the catabolic activity stimulated by altitudes of more than from 1200 to 2000 feet is always harmful to those patients having persistently high temperature.

In cases of **chronic, slowly progressive phthisis**, better results, on the whole, are obtained from warm winter resorts and sometimes from sea voyages.

Quiescent cases, with extensive damage or cicatrization, are generally better off at but slight elevations, such as, according to the time of year, MERAN, GARDONE-RIVIERA, ARCO, MONTREUX, or BADENWEILER, or on the RIVIERA, or in EGYPT. In the United States, the BLUE RIDGE and ALLEGHANY regions from the Carolinas through to New York, the ADIRONDACKS, and the WHITE MOUNTAINS afford many suitable resorts, as also do SOUTHERN CALIFORNIA, GEORGIA, FLORIDA, and NEW JERSEY. Sea voyages sometimes improve the general health.

In cases **complicated with kidney disease** high altitudes should be avoided, and dry winter resorts, like EGYPT or the RIVIERA, be recommended. For English persons who cannot leave their country one of the mild seaside winter resorts like BOURNEMOUTH may be selected. ATLANTIC CITY, PALM BEACH, or one of the mild seaside resorts of SOUTHERN CALIFORNIA or pine regions somewhat inland, such as LAKEWOOD and HAMMONTON, in New Jersey, or THOMASVILLE, in Georgia, may be chosen by Americans.

The complication of **mild diabetes** does not exclude the use of

¹ *Op. cit.*, p. 790.

high altitudes, but the latter are injurious in cases with advanced diabetes and emaciation. High altitudes should be avoided when tuberculosis is secondary to diabetes.

Chronic cases with much catarrh require winter resorts with as little wind as possible, such as PAU and ARCACHON, and in England, BOURNEMOUTH; but in the case of young persons, localities of high elevation with little wind are not counterindicated, and are often even to be preferred. High altitudes are counterindicated in chronic cases with marked **emphysema** or with **cardiac disease**; these cases require warm winter resorts, such as MADEIRA, the CANARY ISLANDS, and PAU, and places with pine woods, such as ARCACHON and BOURNEMOUTH. During summer, sheltered localities of moderate elevation, situated in large forests or in well-wooded valleys, are useful in many chronic or quiescent cases, with bronchitic or emphysematous complications. The moderately moist and refreshingly cool forest air of such localities exercises a tonic yet soothing influence, while the sheltered positions and shady surroundings enable patients to spend the greater part of the day in the open air. In the United States, CORONADO, SANTA BARBARA, and PASADENA in California, and many places in central Florida—as, for example, WINTER PARK, ORLANDO, OCALA, KISSIMMEE, BARTOW, and LAKELAND—are well adapted for winter residence for this class of cases. THOMASVILLE, Georgia, and CAMDEN, South Carolina, are also favorable during the cooler months, or HOT SPRINGS, Virginia, and GLEN SUMMIT, Pennsylvania, during the warmer season.

When **asthma** complicates pulmonary tuberculosis, the idiosyncrasies of the patient in regard to localities must be ascertained if possible. When these are unknown, no certainty in the choice of climates is possible; but in the majority of relatively young persons high elevations should be preferred, while in older persons moderately warm localities at only slight elevations should be selected, such as GRASSE, near Cannes, MONTREUX, LOCARNO, and MERAN, or places amidst pine woods, such as ARCACHON and BOURNEMOUTH.

In the United States, there are numerous places in Colorado and New Mexico that are suitable for cases of pulmonary tuberculosis complicated by asthma. The LAS VEGAS Hot Springs, in New

Mexico, and the CASTLE CREEK Springs, in Arizona, offer a suitable climate and good accommodations for this class of patients. In the Eastern States, HOT SPRINGS, Virginia, DEER PARK, Maryland, KANE, Pennsylvania, and the CATSKILLS of New York, are available during the summer ; in winter, patients will find a suitable climate at ASHEVILLE, North Carolina, AIKEN, South Carolina, and THOMASVILLE, Georgia.

We shall now consider a little more closely the results that may be expected from the climates that have been most frequently employed in the treatment of pulmonary tuberculosis.

HIGH ALTITUDES

The custom of sending consumptives from the hot coast of Lima to the cool altitudes of the Andes is supposed to have existed for a very long time, but Dr. Archibald Smith, who for thirty years practised medicine partly in Lima itself and partly in the silver mines of Cerro de Pasco, nearly 13,000 feet above the sea, first drew the attention of the profession to the results obtained. Lima, the capital of Peru, about 12° south of the equator, has a great mortality from phthisis, but patients generally recover if they go early enough into the neighboring Peruvian Andes, at an elevation of 8200 to 9840 feet above sea-level. In Europe high altitudes were not employed in the treatment of phthisis until a later period. From June, 1865, to June, 1866, there are said to have been only two visitors at Davos, the earliest mountain health resort of high altitude in Europe.

The exact results of treatment by high altitudes are as difficult to obtain as the results of any other method of treatment. Sir H. Weber obtained evidence of the condition of 144 patients some years after the cessation of the treatment. Cure was noted in 36, and in 56 there was improvement in the local signs and in the general nutrition ; in 52 cases there was no improvement, deterioration, or death within the first three years of the treatment. He thinks the results would doubtless have been much better if the patients had placed themselves under stricter medical guidance, as they were advised to do. In 7 cases recovery seemed almost complete

when, through some error, chiefly overexertion, a deterioration set in that afterward led to the fatal termination. Dr. C. Theodore Williams and Dr. L. Spengler have published more favorable results, and Dr. Turban¹ has recently obtained 66.1 per cent. of absolute and relative cures in his sanatorium at Davos—that is, by the combined effects of the Alpine climate and sanatorium treatment.

SEA VOYAGES

In regard to the results of long sea voyages, Sir H. Weber found decided improvement in 34 out of 70 phthisical patients, but no obvious change in 18, and deterioration in 18. In 10 of the 34 satisfactory cases the general condition and the nutrition were much benefited, although no obvious change was observed in the local signs; in the other 24 cases improvement was noticed in both local and general signs. Of the 18 patients whose condition was not much changed by the treatment 2, it should be mentioned, lost their fever during the voyage. In 7 cases hemoptysis occurred once or several times during the voyage, generally in the hot regions; in one case improvement was not impeded by the hemorrhage. Of the 34 patients who improved, 27 were in the first stage of pulmonary tuberculosis, 6 were in the second stage, and 1 was in the third stage. Twelve of the 70 patients were women, and 11 of these afterward expressed themselves against the advisability of sea voyages for female patients.

Walshe had a high opinion of the value of sea voyages. In suitable cases, especially in young men, he thought a voyage could be of more use than any other method of treatment. Maclaren and Faber saw good results in some cases. C. T. Williams, in 1887, found improvement in 89 per cent. of a small number of patients.

In a series of 11 phthisical men between the ages of nineteen and thirty-five without fever, who undertook voyages of from three to five months connected with the whale fisheries in the northern seas, the result, Sir H. Weber found, was very favorable in 6 cases

¹ "Beiträge zur Kenntniss der Lungen-Tuberkulose," by Dr. K. Turban, 1899, p. 154; see also comparisons made by S. E. Solly in his paper on "Sanatorium Treatment and its Relation to Climate," "Philadelphia Medical Journal," December 1, 1900.

and tolerably satisfactory in 3 ; the other 2 patients, it may be noted, had a special aversion for the monotonous, badly prepared food that was provided.

Sir H. Weber's experience of patients in the first or the second stage of pulmonary tuberculosis who spent a longer or shorter time in yachting has been, on the whole, satisfactory, but the results showed that medical supervision was required. In this respect large passenger ships with a ship's doctor have the advantage, although it cannot be said that even then the medical supervision is generally a sufficient one. Large ships specially constructed and furnished to serve as 'ocean sanatoriums' for pulmonary tuberculosis, as described in Part I of this work, may possibly be introduced at some future time when more attention is directed to the subject. They would enable consumptives to derive the maximum benefit from ocean climates.

The Desert Climate of Egypt

The desert climate of Egypt has undoubtedly a beneficial action in many cases of phthisis. The wandering tribes of the desert, so long as they live in tents, remain free from consumption, but those members of a tribe who, for some reason, come to inhabit towns not rarely fall victims to the disease. Among phthisical patients for whom the desert climate of Egypt is especially indicated are cases complicated by emphysema and bronchitis with much expectoration, and cases complicated by albuminuria. Insomnia and nervous irritability, which may be very troublesome complications of tuberculosis, are often relieved by desert climates.

Mineral Water Health Resorts

Several mineral water health resorts have obtained considerable popularity in the treatment of phthisical cases, and in quiescent and very chronic cases they are certainly sometimes of use. The sulphur waters of the Pyrenees have an old-established reputation, and among these EAUX-BONNES, CAUTERETS, LE VERNET, AMÉLIE-LES-BAINS, and LUCHON may especially be mentioned. At these places the catarrhal conditions associated with quiescent phthisis are often alleviated. GLEICHENBERG, LA BOURBOULE, OBERSALZ-

BRUNN, and other muriated alkaline, simple alkaline, and muriated waters are often useful for dyspeptic disorders, bronchial catarrh, etc., occurring in cases of quiescent and obsolete tuberculosis. WEISSENBURG, in the Swiss Canton of Berne, has a sheltered position in the beautiful pine and beech forest of a mountain valley, and is a popular summer resort for chronic cases of phthisis with catarrhal complications. LIPPSPRINGE, in Westphalia, probably owes a part of its reputation to the effect of its rather moist and mild summer climate in a similar class of cases. The chalybeate spa of REINERZ, in Prussian Silesia, has a fresh, moderately moist summer climate, and is likewise much resorted to by phthisical patients without fever. The reputation of all these health resorts doubtless depends largely on the presence of medical men who are thoroughly familiar with the general management of phthisical patients and with the various forms and complications of the disease.

At many sanatoriums and health resorts **hydrotherapeutic methods** have been held in high esteem. Some, indeed, have advocated the use of hydrotherapeutics as the chief element in the treatment of pulmonary tuberculosis. Without going to any extreme, however, it may be admitted that the judicious use of cold and tepid douches, shower baths, and other hydrotherapeutic measures carefully adapted to the individual case and prescribed and carried out with precision, may be of great service in the management of phthisical patients, by keeping their skin in good condition, by aiding the open-air treatment in increasing appetite and promoting general nutrition, thus enabling the organism to react better against the parasitic invasion, and by rendering the patient less susceptible to sudden atmospheric changes. It is hardly necessary to add that, owing to their 'hardening' influence, simple forms of hydrotherapeutics must be admitted, together with climate and general hygiene, among our means of preventing the development of tuberculosis in susceptible subjects—preventive treatment.

Whatever climate and health resort be chosen for the treatment of the case, the dwelling should be examined carefully. It should get much sun, should be sheltered from winds, and be situated in a locality that is free from dust, although the ground should be dry.

The house should be distant from stagnant water and swamps, and from the impure air of factories and of overpopulous districts.

At the risk of some repetition, the editor would append the following **general considerations** concerning the relations of climate with the therapeutics of pulmonary tuberculosis.

In many cases patients cannot leave their homes or abandon their means of support ; for such persons, in addition to the open-air régime, attempts must be made, by providing artificially modified atmospheres, by hydrotherapeutic methods, and otherwise, to imitate at home certain climatic effects.¹ In other cases the patient's constitution, his mental temperament, or the advanced stage of the disease, renders removal from home comforts unwise. In still other instances, climatic treatment is unnecessary. In those cases in which it is both wise and possible, the **purpose** of climatic treatment may be to **prevent** the development of the disease in a susceptible subject, or to promote **recovery** in one already attacked. In either instance the proximate object may be either protection or invigoration. In a third group of cases recovery is not to be anticipated, and in these, the purpose of treatment being to **prolong life** and to **increase comfort**, the immediate object must be protection. In all classes the aim must be to find a place where the patient can be out-of-doors most of the time, and can find opportunities not only for pleasant rest, but also for congenial and beneficial occupation of mind and body. In many instances, especially when definite lesions are present, it is well for the patient to fix upon a suitable locality for permanent residence ; one in which he can make a home for himself and those dependent upon him. In all, the special factors of the individual case will determine the choice of locality within the general limits indicated.

The principal factors in **protection** are warmth, relative dryness, equability, low elevation, and absence of high winds. In some instances, however, the sedative effects of moisture, in warm marine climates, are advantageous.

¹ See "Artificial Climatic Effects for Stay-at-homes," by S. Solis Cohen, "Philadelphia Medical Times," Feb. 6, 1886.





The principal factors in **invigoration** are coldness, dryness, variability, and altitude. Relative purity of atmosphere is desirable for both objects.

When **protection** is chiefly desired, warm, equable, moderately dry, and fairly sheltered regions, either on the coast or inland at moderate elevations, are to be sought. Both on the coast and inland, the proximity of pine forests is an advantage. Among suitable stations of different types are ALGIERS, MENTONE, ARCA-CHON, MERAN, the UNDERCLIFF OF THE ISLE OF WIGHT, SAN ANTONIO, AIKEN, LAKEWOOD, SANTA BARBARA. Winter voyages in warm waters are useful in individual cases. Comforts, and especially food and its preparation, are of great importance, and, with due regard to the patient's usual mode of life, may determine the choice of locality.

When **invigoration** is principally in view, mountain climates of medium or high altitude, dry, fairly cold, and moderately variable, are to be preferred, both in winter and in summer. As somewhat varying types of such stations, the resorts in the SWISS ALPS, the ANDES, the ROCKY MOUNTAINS of Colorado, the WHITE MOUNTAINS of New Hampshire, and the higher mountain ranges of SOUTHERN CALIFORNIA, and of MEXICO, may be cited. The sea-shore, however, in the colder climates—as, for instance, of New England—may be useful in summer, and well-chosen sea voyages are often beneficial. The comforts of life, and the character of the food and cooking are of less importance than in the previous group of cases. In many instances a certain degree of hardship is even beneficial; and for these patients 'ranching,' 'lumbering,' 'cow-punching,' and other open-air occupations somewhat rough in type, may be advised.

When **relative protection**, with some **degree of invigoration** is the object, the choice of means lies among the following: Sea voyages in warm or cold waters, according to the time of year; seacoast climates somewhat cool and variable; mountains of moderate elevation, preferably cool in summer and not too cold in winter, and clothed with evergreen forests. Among the most suitable mountain stations in America are certain resorts in

and NEW MEXICO, the ADIRONDACK and SHAWANGUNK ranges in New York, the POCONO range in Pennsylvania, the neighborhood of BURKE'S GARDEN in Virginia, the CUMBERLAND range in Kentucky and Tennessee, ASHEVILLE in North Carolina, and many stations in the foothills of SOUTHERN CALIFORNIA ; for patients who can endure high altitude when combined with shelter, mildness, and relative equability, IDYLLWILD, in the San Jacinto Mountains of California, is to be considered ; while ATLANTIC CITY is an appropriate seaside resort.

In **prevention**, while protection may be sought at first, invigoration must be the ultimate aim, and thus weakly children that in their earlier years must be sent to warm seacoasts and sheltered inland hills, may in adolescence be able to endure climates of progressively greater variability. Those who, despite inherited or acquired tendencies or liabilities, are fairly robust, should from the first be subjected to the stimulating influences of altitude,—not the least among which are the necessary climbing exercises,—and should be progressively habituated to greater degrees of cold, and increasing range of variation.

In **treatment**, the factors governing the choice of climate are many, and their association in the individual case is often complex. No one method can fully exhibit them to view. In addition to the considerations based upon history, lesions, and symptomatology already given, help may be derived from the observation of certain general tendencies. Excluding from present consideration cases of terminal hectic, special stress may be laid, first, upon the **pyrexial reaction** of the patient, as indicative of his powers of resistance, and of the degree and character of his toxemia ; excessive pyrexial reaction being an unfavorable sign. Empirically assuming 100° Fahrenheit as a convenient and approximately accurate limit, patients whose temperature persistently reaches or exceeds, or exhibits a tendency frequently to recur to, this limit may be placed in the group of those of excessive febrile reaction ; and this independently of the extent or stage of pulmonary lesions. It is not tuberculosis alone that we have to contend with, but special individual failures in defensive adjustment, and toxemia of multiple origin and complex

1. The first part of the document is a list of names and addresses of the members of the committee. The names are listed in alphabetical order, and the addresses are listed below each name. The list includes the names of the members of the committee, the names of the members of the sub-committee, and the names of the members of the advisory committee. The addresses are listed in the same order as the names.

character. In the editor's experience such patients do not well bear altitudes of more than two thousand feet. With them, protection, rather than invigoration, must be the first object. It is important, moreover, that they be removed into a germ-free atmosphere. As that of mountain heights is unavailable, that of the open ocean must be sought, and prolonged sea voyages, other things being equal, offer the best chance for recovery, or even for survival. After the occurrence of the decided change that is brought about by a well-chosen voyage, the patient may stay upon the seacoast in a dry region, warm, or moderately warm, or seek the dry desert climate; or, if sufficiently robust, sojourn at a sheltered locality of moderate altitude, or seek progressively colder and higher regions in accordance with the continued necessity for protection, or the progress toward recovery. So often have bad results been observed when patients of this class, seen in consultation, have been allowed, against advice, to seek the high elevations of Colorado or New Mexico, that it seems a duty to place upon record here an emphatic warning against the dangers of altitude in such cases; and, on the other hand, so good have been the results that in certain instances have followed the advice to seek health upon the sea and preserve it in equable regions of moderate elevation, that the recommendation for this course must be made equally emphatic.

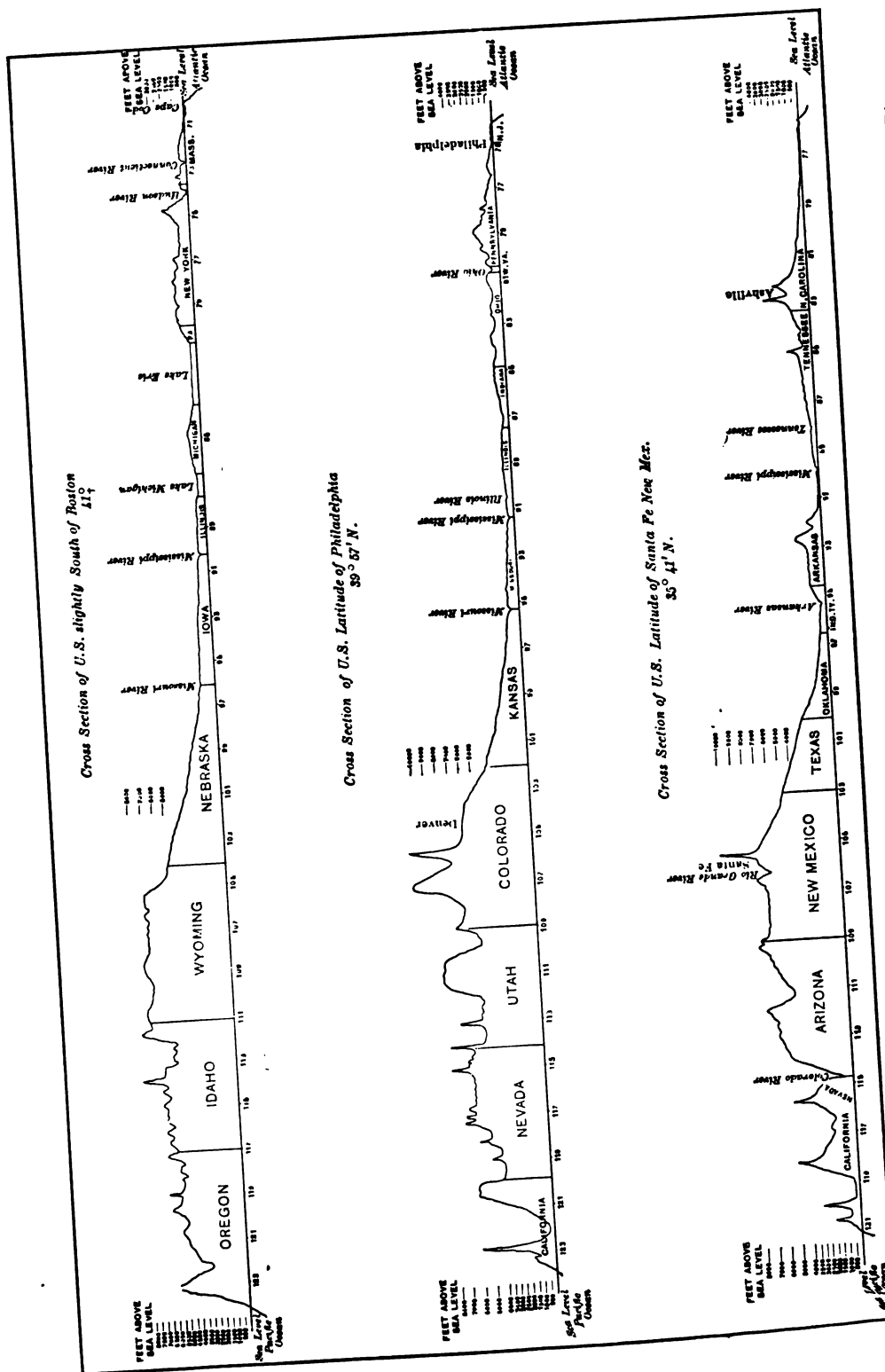
From another viewpoint, cases may be studied in accordance with their **temporal and spatial reactions**; that is to say, according to the power of the organism to **limit** the morbid processes—primary, secondary, and tertiary—in time or in space. Five principal divisions, with numerous subdivisions, may be made, of which the former only need be considered. These are: First, processes with **little or no tendency to limitation** in space or in time. Under this head would come acute miliary tuberculosis and florid phthisis, for neither of which, as a rule, can climatic treatment be advised; although in individual instances of galloping consumption, when the patient is sufficiently wealthy, palliation may be afforded by suitable climatic measures.

Second, cases exhibiting **little tendency to limitation in space, but marked, though often intermittent, tendency to limita-**

tion in time. These cases may, in their inception, closely resemble cases of galloping consumption, and considerable loss of pulmonary tissue may occur within a comparatively short time. Suddenly, however, without recognizable cause, activity of morbid processes comes to an end. The patient gains in strength and flesh, and loses his cough, his fever, and other general and local symptoms. The remission, or intermission, may persist for months or for years, when, without recognizable cause, or following some indiscretion or exposure, local and general symptoms of greater or less severity are again manifested. There is often, in such cases, excessive pyrexial reaction. The outlook may be profoundly discouraging, but recovery again takes place; and this alternation of active symptomatology and apparently complete abeyance may go on for many years, eventuating in some cases in the ultimate triumph of the morbid tendency, in others in final recovery.

The third group of cases exhibits **little tendency to limitation in time, but marked tendency to limitation in space**. In such cases there may have been at first extensive or limited lesions, rapid or slow progress, but recovery takes place locally and generally, except that the persistence or frequent recurrence of active processes—as manifested upon percussion by board-like tympany, perhaps surrounded by a larger area of dulness, and upon auscultation, by moist rales—can be demonstrated in a limited area—usually just below one apex, anteriorly; or near the angle of the scapula, posteriorly. With this, often goes intermittent pyrexial reaction.

In both the second and the third group of cases the **choice of climate** will depend largely upon the patient's general constitution and temperament, and upon the condition of the heart and blood-vessels. As a rule, patients of the second group need protection at first, when convalescing from the original attack, or from one of the recurring exacerbations; and if delicate, or with small hearts, or of erethistic temperament, with tendency to irritable overaction of the heart or incomplete control of the vessels, should remain in a mild and equable climate for years, or permanently. If of robust type, without erethistic tendencies, and with good hearts and





vessels, and not too far advanced in years, they may soon be sent to moderate altitudes in comparatively cold regions, and, as recovery progresses, to high altitudes like those of the ALPINE winter resorts or the ROCKY MOUNTAINS. Under favorable conditions as to vessel, accommodations, and food, sea voyages in warm waters are useful for the delicate, and long voyages, as to South Africa or Australia, for the more robust.

The same general advice applies to the third class of patients, modified, of course, by individual circumstances, and with greater necessity for resort to the ocean in the endeavor to bring to an end the persistent tertiary process; that is to say, the limited, local softening; more especially if this be accompanied with fever. Should the voyage be successful, it is usually well at first thereafter to seek a sheltered inland resort of moderate elevation, such, for example, as MERAN; or in the case of more robust patients, higher elevations or colder latitudes, as GOERBERSDORFF or IDYLLWILD, and, later, the full effects of high altitude, as at DAVOS or COLORADO SPRINGS.

In the fourth class of patients there is **no tendency to limitation in time, but fairly marked tendency to limitation in space.** The local morbid process, however, does not, as in the previous group, remain active in the tertiary phase in one place, but spreads slowly and sluggishly over successively limited areas, remaining for the most part in the secondary stage. This form of disease is usually called fibroid tuberculosis. Patients live on, but without recovering, in almost any climate, under almost any conditions; and for them, therefore, climatic advice must be purely individual. Some do well in winter at resorts of the type of LAKEWOOD or HAMMONTON.

In the fifth group, **neither the spatial nor the temporal limitation is markedly good or markedly bad.** These are the ordinary cases of chronic pulmonary tuberculosis, with its innumerable individual variations; and, as they are robust or delicate, sluggish or crethistic, have good or poor circulatory systems, and according to the stage or progress of their lesions, toxemia, and complications, as sufficiently set forth in preceding pages, must the patients be protected, or an invigorating environment be sought for

them, in the endeavor to develop decided temporal or spatial limitation, or both.

The cure of tuberculosis, during the early stages at least, like its prevention, is possible in all healthful climates where good diet can be obtained and where much time can be spent in the open air. It must be acknowledged, however, that some climates have advantages for various cases over other climates; among these those of high altitudes are especially to be recommended. Climatic treatment should, however, always be accompanied by general hygienic methods. The patient's blind reliance on the climate and the absence of medical supervision frequently lead to great errors, to aggravation of the disease, and to an unnecessary fatal result. For the majority of patients, therefore, whether wealthy or poor, **sanatorium treatment**, with its constant medical supervision, is to be preferred. For poor patients, however, it is the only really satisfactory method of treatment, and the erection of sufficient sanatoriums for the poorer classes must be regarded as a national want in every country (*vide* Sir Hermann Weber, *loc. cit.*).¹

Concerning such institutions in America, the following illustrative but not exhaustive data may be appended.

In Canada there are two excellent sanatoriums for the tuberculous: The **Muskoka Cottage Sanatorium** at Gravenhurst, Ontario, opened in 1897, has an elevation of 1000 feet, and a capacity of

¹ Dr. S. E. Solly, in the "Philadelphia Medical Journal," December 1, 1900, sums conclusions as follows: "Sanatorium treatment is a good thing, particularly when patients are kept in the full air, but that is not quite such a good thing, or as widely applicable, as its advocates believe. It is not the quantity of the air, or the negative virtue of purity, that is alone desirable, but the quality of the air that is also of supreme importance; in other words, climate is of the greatest value, and if equally good hygienic conditions are given to the patient, that patient who is placed in the climate best suited to his needs is going to improve the quickest, and his disease is more likely to be permanently arrested. The oft-asserted belief of the advocates of home sanatoriums that a tuberculous patient is best cured in his own climate is, I believe, a fallacy. He is cured as much on the mountain top, the wide plain, or the seashore as those cured at home, and no more and no less. There are certain evident economic reasons why home sanatoriums should be encouraged, up to a certain point; but when circumstances permit, it is safer to change the air and locality of the consumptive for a time, and by doing so results are brought about much more rapidly and surely than if he remains at home. Nevertheless, climate without hygiene is but as 'sounding brass and a tinkling cymbal.' "

about sixty. The National Sanatorium Association expects to erect another institution near Toronto. The **Laurentian Sanatorium**, one mile from the village of St. Agathe des Monts, sixty-four miles from Montreal, has an elevation of 2000 feet and a capacity of twenty-five.

In the United States excellent sanatoriums have been established for the tuberculous, but their number is as yet too few and their capacity is too limited. The first and the most widely known is the **Adirondack Cottage Sanitarium**, founded in 1883 by Dr. Alfred L. Loomis and Dr. E. L. Trudeau. It is situated at Saranac, New York, at an altitude of 1750 feet. It has a capacity of 100 and there are 24 buildings on the property. (See p. 111.) The **Sanatorium Gabriels** is near Paul Smith's, a well-known summer resort in the Adirondack Mountains, about fourteen miles from Saranac. The land was given by Dr. Seward Webb and Mr. Paul Smith, and the institution was opened in 1897.

The **Loomis Sanitarium** at Liberty, Sullivan County, New York, built and named in memory of Dr. A. L. Loomis, was opened in 1896. A charitable annex was opened in 1901. (See p. 116.) The **Montefiore Home Country Sanatorium** at Bedford Station, Westchester County, New York, was opened in 1898. It can accommodate 150 free patients. The **Brooklyn Home for Consumptives** was opened in 1886, and has 107 free beds. The **Pasteur Sanatorium** for tuberculous patients at Suffern, Rockland County, New York, at the foot of the Ramapo Mountains, has an elevation of 500 feet. The **Seton Hospital** at Spuyten Duyvil, upper New York city, has an elevation of 250 feet above sea-level, and admits poor consumptives. It was opened in 1892, and furnishes accommodations for 160. **St. Joseph's Hospital for Chronic Diseases of the Chest**, in upper New York city, was opened in 1882, and has 365 beds.

The **Massachusetts State Hospital for Consumptives** at Rutland, Massachusetts, fifty miles west of Boston, was opened in 1898. It has an elevation of 1200 feet, and a capacity of 100. The **Sharon Sanatorium** at Sharon, near Boston, was opened in 1891. The **Free Home for Consumptives** in the city of Boston was opened in 1892.

The **Hospital for Diseases of the Lungs**, Chestnut Hill, Philadelphia, has an elevation of 400 feet, and a capacity at present of 65. The **Lucien Moss Home** of the Jewish Hospital of Philadelphia, situated at Olney, was opened in 1900, and has a capacity of 24. The **Rush Hospital for Consumption**, Philadelphia, was opened in 1892. Its present capacity is 35. The "**Free Hospital for Poor Consumptives**" has as yet no special building, but maintains about 150 free beds in special wards of various hospitals in Philadelphia and other cities of Pennsylvania. It will shortly erect a sanatorium at White Haven, Luzerne County, Pennsylvania.

The **Glockner Sanatorium**, Colorado Springs, has an elevation of 6000 feet. (See p. 177.) '**The Home**,' Denver, Colorado, has an elevation of 5280 feet and a capacity of 80. The **National Jewish Hospital for Consumptives**, at Denver, Colorado, was completed in 1892, and opened in 1899. It can accommodate 65 patients. The **Rocky Mountain Industrial Sanatorium**, with headquarters at Denver, has been projected, but is not yet in operation. It will aim to furnish occupation outside of the large cities—agriculture, cattle herding, etc.—to patients dependent upon their own exertions for their livelihood. **St. Anthony's**, the **Latta Sanatorium**, and the **Ladies' Home Sanatorium**, East Las Vegas, New Mexico, are for the treatment of tuberculous patients. There are similar institutions at Chicago, Asheville in North Carolina, Citronelle in Alabama, and Boerne in Kendall County, Texas. The **Sanatorium for Tuberculous Sailors**, under the management of the United States Marine Hospital Service, at Fort Stanton, New Mexico, has thirty-eight buildings and a capacity for 200 patients. (See p. 170.)¹ The **General Hospital for the Treatment of Pulmonary Tuberculosis**, of the United States Army, at Fort Bayard, New Mexico, has been extended over all buildings at this post, now discontinued as an army barracks. In 1900, the admissions numbered 283.²

¹Descriptions and plans of many of these institutions are given in "**Pulmonary Tuberculosis: Its Modern Prophylaxis**," etc., by Dr. S. A. Knopf, P. Blakiston's Son & Co., Philadelphia, 1899, 343 pages.

² See "Report to the Surgeon-General of the U. S. Army," by Major D. M. Appel, M.D., "**American Medicine**," June, 1901.

SCROFULA AND CHRONIC TUBERCULOUS AFFECTIONS OTHER THAN PULMONARY TUBERCULOSIS

Under the term 'scrofula' are included : (1) A number of affections, chiefly involving the lymphatic glands, the joints, and the osseous system, that, since Koch's discovery of the tubercle bacillus, have been recognized as tuberculous in nature ; in fact, we include them in tuberculous affections other than pulmonary tuberculosis ; (2) a tendency to chronic, indolent, inflammatory enlargement of the lymphatic glands and lymphatic tissues, which renders them a favorite nidus for the tubercle bacillus ; this second use of the term 'scrofula' is, we believe, the correct one. True, many eminent authorities affirm that all these chronic enlargements of glands are tuberculous in nature, but as yet this view has hardly been justified by pathologic investigation and clinical observation. It appears more likely that in the early stages, at least, the so-called scrofulous enlargement of glands may be caused by chronic irritation of many different kinds without the presence of the tubercle bacillus being necessary. In fact, the lymphatic tissue of 'scrofulous' individuals apparently reacts in a different manner from that of normal persons and is more vulnerable. The scrofulous or 'strumous' habit is chiefly noticeable during the earlier periods of life, the peculiar vulnerability of the lymphatic tissues being often lost as the child grows older. In scrofulous children dental caries, slight tonsillitis, skin eruptions, etc., give rise to an excessive but sluggish reaction in the lymphatic glands corresponding to the part of the body affected, and the swelling in the glands may not entirely subside even when the original source of irritation has been removed. Although, however, scrofulous enlargement of glands may probably in the first place be caused by a number of different micro-organisms or merely by the irritation of unorganized substances carried to the glands from the skin or mucous membrane, there can be no doubt that infection of the enlarged glands by the tubercle bacillus is soon likely to take place. However, even after the glands have become tuberculous, the disease generally runs a very different course from that of tuberculosis of the lungs.

In the **prevention of scrofula in children** suitable feeding, pure

air, and good general hygienic conditions are the points to be aimed at. The milk and other food, the air, and the ground,¹ on which the child is always crawling, must be kept as free as possible from tubercle bacilli by the recognized methods. Children of a scrofulous disposition should, if possible, not be reared in large towns, but in healthful country localities with pure air and dry soil. The education of scrofulous children should be carried out entirely in the country, or, in most cases, better still, at good **seaside** localities where, moreover, more attention can be paid to their physical training than in large towns. High altitudes have an especially good effect on children and young persons when there is a tendency to tuberculosis of the lungs; but in most cases of tuberculosis of the lymphatic glands, joints, and bones, and in a tendency to these affections—that is, a scrofulous disposition—marine climates seem to have the advantage over all others. The choice of the sea climate must, of course, depend on the reactive powers, but in general, as Rochard has pointed out, any sea air is better than the impure atmosphere of large inland towns. Sea voyages are usually limited to the children of the wealthy, but coast climates almost always give just as good results. For children who can endure cold and whose reactive powers are good, probably no better places can be found than the bracing health resorts on the **EASTERN ENGLISH COAST**. For more delicate children who bear cold badly, especially when they are natives of more southern latitudes, such as Spain, Italy, and the south of France, the warmer seaside resorts of the **RIVIERA** and other shores of the **MEDITERRANEAN**, **BIARRITZ**, and **ARCACHON** may be preferred; and for similar cases in England the warmer and more equable localities on the southwestern coast, such as **BOURNEMOUTH**, **TORQUAY**, **PENZANCE**, and others, may be recommended for the winter.

In the United States, no better place can be found for strumous and tuberculous children, during winter and spring, than **ATLANTIC CITY** or **CAPE MAY** on the New Jersey coast. The proximity of

¹ Volland, of Davos, thinks that tubercle bacilli derived from phthisical expectoration, etc., on the floors and ground on which infants are allowed to crawl may be a chief cause of tuberculous glands, etc., in young children.

the Gulf Stream renders the climate at all periods of the year much more suitable to their needs than in the case of inland resorts. There are, no doubt, localities on the southern shore of LONG ISLAND that may prove equally beneficial and before long may be recognized and employed to a large extent as a resort for children from New York and the surrounding neighborhood. Children also do well in the mountains. In summer it is immaterial where children go, so long as they leave the cities and get out into fresh air, and receive pure milk and a wholesome country diet. The 'fresh air funds' and 'children's country week associations' of American cities do an immense amount of good in this way.

In former years Kreuznach, Ems, Soden, Reichenhall, and other localities were frequently recommended, but spa treatment is now regarded as of secondary importance. However, inland health resorts in which **brine baths** can be obtained may still sometimes be recommended, especially when resort cannot easily be had to seaside localities. In some young persons with chronic enlargement of the lymphatic glands of the neck, with or without enlargement of the tonsils, the internal use of **muriated waters**, such as those of Kissingen, Homburg, etc., gives good results; **gaseous thermal brine baths**, such as those of Nauheim, are likewise sometimes serviceable on account of their general stimulating effect on the metabolism. In the milder cases of adenoid vegetations of the nasopharynx, and in children after the adenoids have been removed by operation, sea air is generally beneficial, and a seaside locality can be chosen according to the season of the year and the reactive powers of the patient. In similar conditions in weakly children some of the inland health resorts in the Pyrenees and elsewhere, where local sprays of **sulphurous mineral waters** are employed, have been much recommended by many physicians on the Continent.

In America, ST. AUGUSTINE, PALM BEACH, MIAMI, TAMPA, and other resorts in Florida, BERMUDA, NASSAU, and, in California, CORONADO and PASADENA are suitable winter and spring resorts for cases of this class.

In scrofulous children with **tuberculosis of the joints and bones** or obviously **tuberculous disease of lymph-glands**, surgical inter-

ference must not be too long delayed but even in these cases "open-air treatment" in climates and health resorts, such as those already referred to, can be made good use of after operative treatment, and the surgical measures themselves seem to be more successful when carried out in suitable climates. This is confirmed by the results obtained in the sanatoriums for children at Margate, at Berck-sur-Mer, at the little hospital of Samaden, in the upper Engadine, and at others. We must here once more refer to the great importance of **seaside sanatoriums** for scrofulous and weakly children of the poorer classes. More are needed in every country, and similar institutions for weakly children might be erected at many healthful inland localities. In the United States the Children's Seashore House at Atlantic City, and the Seaside Home at Cape May Point are good examples.

CHAPTER X

DISEASES OF THE RESPIRATORY ORGANS OTHER THAN TUBERCULOSIS

Chronic Catarrh of the Pharynx, Larynx, and Nose. Chronic Bronchitis and Pulmonary Emphysema. Bronchiectasis. Remnants of Pleurisy and Pleuritic Effusion. Hay Fever. Asthma.

CHRONIC CATARRH OF THE PHARYNX, LARYNX, AND NOSE

In delicate persons who do not endure cold well, winter residence in warmer climates often gives relief. EGYPT or the RIVIERA may be chosen for an extended visit, or, when there are much irritation and little discharge, moister climates, such as AJACCIO, ALGIERS, MADEIRA, or the relatively drier resorts of the CANARY ISLANDS. A long ocean voyage exerts a hardening influence in some of these cases, and may prevent recurrence for some time. When nasal and nasopharyngeal catarrh are connected with nasal polypi and adenoid vegetations, these causes require attention. After adenoid vegetations have been removed by operation, a prolonged stay at the seaside is useful for most children, especially when there is any scrofulous tendency. In chronic laryngeal and pharyngeal catarrh, such causes as tobacco, alcohol, and excessive use of the voice must, of course, be removed. In the so-called 'clergyman's sore throat,' which occurs in clergymen, public speakers, singers, and others, a long period of rest is required, and spas and climates may be chosen according to the patient's constitution. A long sea voyage will frequently be useful in these cases.

In many cases the patient's general health and constitution furnish the best indications. A kind of hardening influence can often be brought about by appropriate hydrotherapeutic measures at home and at health resorts, especially when the locality selected for treat-

ment is warm enough and sufficiently sheltered to allow of much time being spent in the open air. Spa treatment during summer often is useful. For the debilitated and anemic, simple thermal spas, muriated spas, chalybeate spas, and sometimes arsenical spas may be recommended, according to special indications. In stout, plethoric persons, who eat and drink too freely, a course of treatment at sulphated alkaline spas such as those of SHARON and RICHFIELD, in the United States, often has a beneficial effect on the pharyngeal and laryngeal disorder; but permanent alteration in diet and regimen is required to maintain the improvement. When gout, obesity, dyspepsia, chronic intestinal catarrh, and habitual constipation are present, they require special attention, and in these cases spa treatment frequently is beneficial. In some cases local treatment is important, and a health resort that is known to furnish this must be selected. At many spas, apparatus for douches, sprays, or inhalations for the nasal, pharyngeal, or laryngeal mucous membranes are much employed, notably at CAUTERETS, CHALLES, MARLIOZ, and other sulphur spas in France, at SHARON and RICHFIELD in New York, at EMS and other muriated alkaline springs, at a great number of muriated springs, and at MONT-DORE and LA BOURBOULE, in the Auvergne Mountains. Cauterets and Mont-Dore have attained considerable reputation for the treatment of clergyman's sore throat.

Chronic Bronchitis and Pulmonary Emphysema

These conditions are allied to each other in so far as each of them tends to produce or increase the other. Most patients of this class endure damp, cold weather and winds badly, and the winter should be spent in some warm, sheltered, sunny climate. As a general rule, when there is profuse expectoration, the drier climates such as those of the RIVIERA and EGYPT, are more suitable, and in cases with little expectoration and persistent irritable cough moister climates, such as those of AJACCIO, PAU, MADEIRA, OLD POINT COMFORT, ATLANTIC CITY, CAPE MAY, and others, are to be preferred. ARCAÇON, BOURNEMOUTH, and HAMMONTON and LAKEWOOD, New Jersey, have the advantage of their pines. During winter, sea voyages in warm climates, such as those to the West Indies or to the Argen-

tine States, or yachting in the Mediterranean, often are useful. During summer, localities of moderate elevation, without much wind or dust, situated, if possible, within or in the neighborhood of large forests—pine forests by preference—should be selected. Such localities are BADENWEILER, BADEN-BADEN, WILDBAD, TEINACH, GREISBACH, RIPPOLDSAU, and others in the Black Forest; FRIEDRICHRODA and LIEBENSTEIN in the Thuringian Forest; SCHLANGENBAD in the Taunus; ALEXANDERSBAD in the Fichtelgebirge; ALT-AUSSEE, KREUTH, ACHENSEE, and ZELL-AM-SEE in the Eastern Alps; and BRÜCKENAU in northern Bavaria.

In America localities with corresponding conditions are found throughout the eastern and southern portions of the United States; mention may be made of the interior resorts of Maine, including MT. KINEO, the MOOSEHEAD LAKE region, and the RANGELEY LAKES; the foot-hills of the WHITE MOUNTAINS in New Hampshire, including LAKE WINNIPISEOGEE, LAKE SUNAPEE, DUBLIN, and LAKE MEMPHRAMAGOG; the GREEN MOUNTAINS of Vermont; the lower stations in the ADIRONDACKS, such as WESTPORT, ELIZABETHTOWN, KEENE VALLEY, BLUE MOUNTAIN LAKE, PAUL SMITH'S, the CHATEAUGAY LAKES, and LAKE GEORGE. Of nearly equal value are the summer stations in northern Pennsylvania, as POCONO MOUNTAIN, EAGLESMERE, and KANE. The various mineral spring resorts of VIRGINIA and WEST VIRGINIA, at elevations of 1500 to 2000 feet, are suitable stations during the summer.

Pulmonary emphysema is in some cases merely a manifestation of **senility** or **premature senility**, which may be more or less local or part of a general change; the emphysema is in these cases an atrophic condition connected with the blood-vessels and with a thinning of the walls of the pulmonary alveoli. The treatment should be a protective one, similar to that already considered under the heading of Old Age and Premature Old Age.

In young patients with a tendency to bronchitis a certain amount of hardening may be effected by general hygienic treatment, hydrotherapeutics, and the like, and by residence at sheltered mountain resorts of moderate or high elevation, especially those amidst pine forests, during summer, and in some cases even by

spending one or several winters at one of the winter resorts of high altitude. Ocean voyages and yachting are likewise beneficial, the voyages to be selected according to the season of the year. During the summer a residence at moderately bracing seaside resorts often has a beneficial effect on the general health.

Mineral water health resorts can be employed in many cases during summer. In gouty and plethoric persons, a course of sulphated alkaline waters, such as those of CARLSBAD, MARIENBAD, FRANZENSBAD, ELSTER, and TARASP, will often do good, but any tendency to gout, obesity, and excessive indulgence in food and alcoholic drinks, which are all very common predisposing causes of chronic bronchitis, must be combated by suitable arrangement of diet, exercise, and general regimen. Many sulphur spas, muriated alkaline spas, and muriated spas have a good reputation as summer health resorts for catarrhal conditions of the respiratory organs. The relative merits of mineral waters in such cases cannot be discussed here, and the reader is referred to the volume on "Hydrotherapy, Thermo-therapy, and Balneology." Among sulphur spas we may mention CAUTERETS, EAUX-BONNES, and other Pyrenean health resorts; among muriated alkaline spas, EMS and GLEICHENBERG; among simple alkaline spas, OBER-SALZBRUNN; and among muriated springs of various strengths, REICHENHALL, BADEN-BADEN, etc. All such spas are furnished with apparatus or with some form of chamber—"inhalatorium"—for inhaling the vapor or spray of the water, and sometimes, as at EMS, also possess apparatus for inspiration from an atmosphere of increased pressure and for expiration into an atmosphere of diminished pressure, or have specially constructed chambers, as at REICHENHALL, for temporarily increasing the atmospheric pressure. Such artificial alterations in the atmospheric pressure give at least temporary relief in many cases of emphysema. Their uses, and that of pneumatic and inhalation methods in general, will be set forth more fully in the volume on "Pneumato-therapy."

At many summer health resorts for bronchitic and emphysematous patients milk, whey, kumiss, and other milk preparations of excellent quality are largely employed.

Bronchiectasis

In these cases warm sheltered health resorts on the MEDITERRANEAN coast, or that of FLORIDA or SOUTHERN CALIFORNIA, or even of VIRGINIA or NEW JERSEY, are beneficial during winter, while during the hotter months sheltered mountain localities at moderate elevations, especially those amidst pine forests, as BADENWEILER, ST. BLASIEN, RIPPOLDSAU, in the Black Forest, MOUNT KINEO, in Maine, LAKE PLACID and PAUL SMITH's, in the Adirondacks, are to be preferred, or a sheltered locality on the ENGLISH CHANNEL, NORTH SEA, or BALTIC.

Remnants of Pleurisy and Pleuritic Effusion

The general health may remain unsatisfactory and the physical signs may be more or less persistent after acute or subacute pleurisy, especially when associated with pneumonia or bronchopneumonia. Climatic resorts are useful in many cases. For young persons and middle-aged persons of fairly strong constitution, resorts of **high altitude** are mostly to be preferred for **summer**, provided that there be sufficient shelter from winds and no special counterindication. For patients of weak and nervous constitution or with damaged hearts who bear high elevations badly, sheltered localities of moderate or low elevation, or seaside resorts may be selected. During **winter**, ALPINE resorts are likewise often useful, but when they are counterindicated by the constitution or the condition of the circulatory organs, the RIVIERA may be preferred, or when there is irritable dry cough, one of the moister, more equable places, such as PAU, AJACCIO, the CANARY ISLANDS, CUMBERLAND ISLAND, or any of the FLORIDA or CALIFORNIA resorts. When the pleuritic affection is suspected to be of **tuberculous** nature, or when it occurs in a scrofulous subject, health resorts of **high altitude** should be preferred unless there be some counterindication. In this connection it may be mentioned that Dr. Theodore Williams and other observers have observed the expansion of the chest, which is so characteristic a result of residence at high altitudes, and Dr. Williams has failed to find the same thoracic development to result from residence at other resorts. Hydrotherapeutic measures, Swedish gymnastics, and the so-called pulmonary gymnastics and breathing exercises and 'arti-

ficial aerotherapeutics,' may help to promote this expansion if carefully adapted to individual cases. In America, when Rocky Mountain resorts are inadmissible, the WHITE MOUNTAIN resorts, and the neighborhood of KEENE VALLEY and LAKE PLACID and the camps about SARANAC LAKE in the Adirondacks, may be recommended.

Brine baths and hydrotherapeutic treatment may help to promote the general health, and for some of the stronger patients, at a later stage, the tonic effect of sea-bathing during summer may be made use of. Passive pleuritic effusions associated with cardiac weakness may in some cases be treated by a course of effervescent baths, such as those of NAUHEIM, with or without the simultaneous use of the resistance exercises devised by the brothers Schott for cardiac cases. (See the volume on "Mechanotherapy.")

Hay-fever

This affection is excited by the action of the pollen of plants, especially that arising from hay-fields, and, in America, the rag-weed (*Ambrosia artemisiifolia*), upon the nasal and ocular mucous membranes. The ordinary 'coryza form' and the 'conjunctival form,' which generally occur together, and the severer asthmatic form, are all best prevented by avoiding the exciting cause—that is, by avoiding the proximity of hay-fields or of localities where the other noxæ are encountered during their 'season.' During the worst season a sea voyage, which gives immediate relief, is often recommended, but the patient must not return until the season for hay-fever is past, for otherwise he may again be affected. Localities, such as portions of some marine spas, that are removed from hay-fields will often be sufficient to keep the patient free, and residence in a large town with paved streets often mitigates the suffering. Appropriate local treatment of the nose, and the use of dark glasses when out-of-doors during the hours of bright sunshine, enable many susceptible subjects to keep fairly comfortable while in town;¹ though an excursion into the suburbs may provoke a paroxysm. Health resorts in the mountains and at the seaside

¹ The editor would reiterate his favorable personal experience with the internal and topical use of adrenal substance; of which adrenalin hydrochlorid is the best preparation. See his article in the "Philadelphia Medical Journal," August 13, 1898.

seem likewise to act in many cases by improving the general health of the patient and rendering his mucous membranes less susceptible to the exciting cause; at all events, they frequently give relief. This relief may be likened to that obtained in many cases of nervous asthma by a visit to high altitude health resorts.

There are innumerable places in the northern portions of the United States and Canada where sufferers from hay-fever find complete relief. The most famous region in this respect is that of the White Mountains in New Hampshire. BETHLEHEM, MAPLEWOOD, DIXVILLE NOTCH, PROFILE, CRAWFORD, TWIN MOUNTAIN, and WAUMBEEK are all well known as places of refuge for hay-fever sufferers. The annual meetings of the United States Hay Fever Association are held in Bethlehem about September 1st, and a list of places where exemption or partial exemption may be found is published annually.¹ The cultivation of flowers such as sweet peas is likely to destroy the immunity that some of these places have enjoyed. Some are thus forced to seek more remote regions, such as the Maine woods about RANGELEY, MOOSEHEAD LAKE, and MOUNT KINEO, the CANADIAN woods, and places in NEW BRUNSWICK and NOVA SCOTIA. ST. ANDREWS and DALHOUSIE, in New Brunswick, and the resorts of CAPE BRETON are quite exempt from hay-fever. MUSKOKA LAKE, in Canada, GOGEBIC LAKE, and the shores of LAKE SUPERIOR are favorable places. CAMPOBELLO, near Eastport, Maine, and the ISLES OF SHOALS are also safe resorts. The interior of the ADIRONDACKS is partially exempt. SCIASCONSET, on Nantucket Island, BEACH HAVEN, New Jersey, and certain sea or mountain resorts in lower New England, Long Island, Pennsylvania, Maryland, and the various southern States have more or less reputation and suit certain individuals, but, as a rule, are not safely to be recommended. If we except the less inhabited mountain regions of NORTH CAROLINA, to be chosen by those who desire camp life in the woods, the almost universal presence of golden rod, rag-weed, roses in their season, cultivated gardens, etc., dusty roads and other irritants, render the middle, southern, and western central United

¹ The Secretary of the Association is Rev. J. Peacock, Witherspoon Building, Philadelphia, Pa.

States scarcely safe for hay-fever sufferers. In the far West, at high elevations, as at BANFF, in the Rocky Mountains of British Columbia, relief may be found.

Asthma

In cases of pure asthma—'neurotic asthma' or 'spasmodic asthma'—climate may often give relief, but the physician is never able to say, before a trial has been made, which climate will suit the patient. On the whole, however, for young persons and when there is no special counterindication health resorts at high elevations give the best chances—that is to say, a greater proportion of patients get more relief from high altitudes than from other climates; more or less complete cure is not rare. Sir H. Weber finds that the younger the individual is, the more likely is he to obtain benefit from prolonged residence in elevated, sunny regions, especially in winter. Resorts with little wind, such as DAVOS and AROSA, COLORADO SPRINGS, MANITOU, GLENWOOD, Colorado, and LAS VEGAS, New Mexico, are to be preferred.

Among **mineral water health resorts** that are visited by asthmatics, those in mountainous regions, such as MONT-DORE, LA BOURBOULE, and the PYRENEAN resorts, have the best reputation.

When asthma is combined with advanced emphysema, very high elevations cannot be recommended, but sheltered resorts in sunny positions, at moderate elevations, such as GRASSE, near Cannes, RUISSEAU-MONT, HOT SPRINGS, Virginia, LAKE PLACID, New York, WAUMBEC, in the White Mountains of New Hampshire, and even the higher localities of GLION and LES AVANTS, above Montreux in Switzerland, may be tried. Dr. Theodore Williams has been particularly impressed by the beneficial effects he has observed in cases of asthma from residence at HYÈRES, on the Riviera.

For aged persons with asthma, great care must be exercised in recommending high altitudes, as arterial changes are frequently present; this precaution is especially to be observed when asthma or asthma-like attacks ('cardiovascular asthma') begin late in life, for the respiratory symptoms in these cases are often actually caused by the cardiovascular changes.

When asthma is secondary to **chronic bronchitis** the climatic treatment should be directed to the bronchitis and emphysema rather than to the neurotic asthma. For fairly strong persons, however, without marked dilatation of the heart, a visit to MONT-DORE is often beneficial. For weaker persons, especially when there is some dilatation of the heart or considerable emphysema, resorts at lower elevations are to be preferred. Among **mineral water health resorts** the muriated alkaline spas, as those at EMS, ROYAT, and GLEICHENBERG, and sulphur spas are sometimes useful, or, when cardiac weakness is a prominent symptom, the effervescent baths of NAUHEIM. In **gouty, plethoric, and obese patients** of strong constitution, a course of sulphated alkaline or simple alkaline waters may often indirectly benefit the asthmatic condition. Sir H. Weber has seen improvement in several cases from treatment at WEISENBURG, which is situated in a beautiful, sheltered and well-wooded valley in Switzerland, at a moderate elevation above sea-level. In cases of **pulmonary tuberculosis** associated with asthma, the asthma must be taken into consideration when selecting a health resort. Sea voyages are often beneficial in cases of asthma, and while residence at the seashore will in some patients induce an attack, others find themselves benefited by it.

CHAPTER XI

DISEASES OF THE CIRCULATORY SYSTEM

The Heart after Acute Rheumatism. The Heart after Influenza. Dilation and Hypertrophy of the Heart and Imperfect Compensation. Angina Pectoris and Myocardial Degeneration. Fatty Infiltration of the Heart. Senile Changes in the Heart. Palpitation and Other Functional Disorders of the Heart.

We need not discuss the numerous cases in which some pathologic change in the valves, generally the mitral valve, is evidenced by the physical signs, but in which the mechanical fault is slight, and in which compensation is perfect, with slight or hardly appreciable cardiac hypertrophy. In most of these cases treatment at climatic or mineral water health resorts, when indicated on other grounds, need not be much modified because a valvular murmur is present. Needless to say, however, before coming to a decision in cases apparently of this class it must always be ascertained, so far as possible, by the patient's history, his general condition, the state of his arteries, and other clinical evidences, whether the cardiac change is the resultant of an old rheumatic affection, or is due to some slight and very chronic sclerotic or atheromatous change, known to have existed practically unaltered for years, or whether it is new and may indicate the commencement of grave progressive disease.

With the so-called functional and hemic murmurs of the heart we are concerned only in so far as climates and health resorts may be indicated for anemia, nervous exhaustion, and other conditions with which they may be associated. The so-called 'cardio-pulmonary' murmurs may, of course, occur in perfectly healthy persons, and do not require our attention.

The Heart after Acute Rheumatism

Rest in bed not only during the acute symptoms,—and this whether or not pain and fever are relieved by salicylates,—but also for a considerable time afterward, is acknowledged to be the best preventive treatment of rheumatic cardiac disease. By careful attention to this point, as well as to diet and the customary pharmaceutical treatment, temporary endocarditis will often disappear, and doubtless endocarditis, as well as pericarditis and myocarditis, will frequently be avoided altogether. This precaution in regard to rest, simple though it appears, is by no means easy to carry out in every case; for the patient, and in the case of a child, his parents, especially when treatment by salicylates has been carried out, soon think that recovery is complete, or that for convalescence a holiday in the country is all that is required. The cardiac valves, however, though giving rise to no murmur, may be infiltrated, and muscular exercise, by throwing a strain on these weakened valves, may cause them to yield, or to undergo chronic sclerotic and deforming changes, as Sir R. Douglas Powell has so clearly pointed out. This accounts for the fact that after acute rheumatism young patients not rarely leave the hospital with their hearts apparently unaffected, and when seen again, after an interval of months or years, are found to have considerable valvular defects. Premature removal to a distant health resort must be avoided almost as much as premature resumption of ordinary work. There comes a time, however, when a change is advisable, as has already been discussed under the heading of Rheumatism; but medical supervision should be long continued in every case. In very prolonged convalescence, the careful use of baths and exercises, such as those practised at NAUHEIM, may be useful.

The Heart after Influenza and Other Infectious Diseases

Cardiac weakness, with a tendency to great frequency or irregularity of pulse, and irritable reaction to the slightest muscular effort or mental excitement, is not rarely one of the most prominent symptoms after influenza and other infectious diseases. Sometimes, also, a slight dilatation may be detected. In many of these cases a change to simple thermal spas or ordinary climatic health resorts

at moderate altitudes may be recommended, combined with open-air life and strict management of exercise. Sedative seaside climates are sometimes helpful. In other cases a course of NAUHEIM treatment may do good. Later, a more distinctively tonic management, climatic and general, may be instituted.

Dilatation and Hypertrophy of the Heart and Imperfect Compensation

We have here to deal with affections of very different origins, including old rheumatic valvular affections, chronic atheromatous changes, the results of pericarditis and adherent pericardium, and the grave forms due to disease of the coronary arteries and the myocardium. When compensation is satisfactory, dry inland health resorts of moderate elevation are mostly suitable; but health resorts at high altitudes are never to be recommended when the heart is much enlarged, even though compensation be perfect. In old valvular disease when there are signs of failing compensation NAUHEIM baths and exercises are frequently serviceable. Sir W. Broadbent and Dr. J. F. H. Broadbent¹ point out that in valvular disease, when compensation has completely broken down, rest in bed and suitable treatment by other means are likely to be more efficacious than baths and exercises. In mitral disease, especially mitral stenosis, these writers believe that, when compensation is just maintained with difficulty, the Nauheim treatment may be of great service; and although in ordinary aortic disease it is not advisable, yet when mitral symptoms supervene, it may become useful.

Angina Pectoris and Myocardial Degeneration

When great obstruction in the coronary arteries or extensive myocardial degeneration is indicated by severe attacks of angina pectoris, paroxysmal cardiac dyspnea, extreme irregularity of pulse, and other symptoms belonging to the grave clinical group of 'myocarditis,' health resorts cannot be recommended, as a rule; rest, with attention to pharmaceutic remedies, diet, and the like, is what is required; and the comforts of home may be of great importance.

¹ "Heart Disease," p. 95, London, 1897.

Fatty Infiltration of the Heart

The treatment of this condition is more or less that of general obesity, to which we have already alluded. In fat and plethoric persons cardiac symptoms, such as breathlessness on slight exertion and irregularity of pulse, are of frequent occurrence, and if the abnormal fatness is allowed to progress, grave signs of cardiac incompetence, such as dropsy and visceral congestions, sometimes supervene. In regard to treatment by health resorts and otherwise, it must be borne in mind that the cardiac symptoms may not be due merely to hampering of the cardiac muscle by the accumulation of fat, but also to actual disease of the muscle-cells of the heart. Great care must be taken to get rid of any possible causes, other than obesity, of the cardiac symptoms, such as the abuse of alcohol and tobacco. It is probably in those cardiac patients in whom the heart's action is merely impaired by the accumulation of fat and in those persons who have neglected suitable exercise that **climbing exercise**, as recommended by Stokes and Oertel, may yield its best results. There are many health resorts in broad valleys at slight and moderate elevations, for example, MERAN, BADEN-BADEN, and other 'Terrain-Curorte,' that are admirably adapted for graduated climbing exercises of this nature. Sometimes the topography of the patient's place of residence—as, for example, in the editor's experience, that of FAIRMOUNT PARK in Philadelphia—may be utilized for this purpose. In all cases medical guidance should be insisted on, as well as attention to diet, both in regard to quantity and quality.

Senile Changes in the Heart

Cardiac murmurs, especially mitral and aortic systolic murmurs, are often heard in the heart of old persons. These frequently occur without hypertrophy or signs of obvious cardiac disease. They are doubtless due to slight sclerotic and atheromatous changes in the valves, and in such cases the remarks that have been made under the heading of Old Age are applicable here. The same advice applies to cases of muscular weakness of the heart and the milder degrees of cardiac myopathy in the aged or prematurely old.

Palpitation and Other Functional Disorders of the Heart

In these cases there is, as a rule, no special indication for climates and health resorts. Attention should be paid to the predisposing and exciting causes, which include, in addition to the temporary debility after infectious diseases, to which we have already referred, very rapid growth at puberty, overwork, impure atmosphere of the work-room, anemia, bad habits, errors in diet, 'bolting' the food, various digestive disturbances, tobacco smoking, and the like. When the disturbance is caused or prolonged by the worries and excitement of social life, a change to a suitable health resort will frequently do good. In the selection of a health resort for excitable individuals of weak constitution, high altitudes should be avoided. In neurasthenic, hysteric, and similar cases **simple thermal spas**, such as SCHLANGENBAD, have given good results. **HOT SPRINGS**, Virginia, and the warm salt baths of **ATLANTIC CITY**, or of **CORONADO BEACH** can be advised in similar cases. When there is congestion of the pelvic and other abdominal organs, **treatment at mineral water** health resorts may often be recommended, according to individual indications. In cases associated with dyspepsia and constipation, treatment of these conditions, to which we have already referred, may suffice to remove the cardiac symptoms. We have already alluded to the cardiac symptoms, with or without dilatation, often associated with chlorosis and other forms of anemia. **Graves's disease**, together with its incomplete forms and allied conditions, is best classed under affections of the nervous system, which will be considered further on.

CHAPTER XII

DISEASES AND DISORDERS OF THE DIGESTIVE APPARATUS

Chronic Digestive Disorders. Dyspepsia. Habitual Constipation. Chronic Diarrhea. Hemorrhoids, Chronic Catarrh of the Rectum, and Pruritus Ani. Affections of the Liver and Bile-ducts. Congestion and Enlargement of the Liver. Cholelithiasis.

Climate can play only a minor part in the management of most cases of disorders of the digestive organs, although in some cases the removal to a more tonic atmosphere, especially the removal from a low to a high elevation, immediately relieves the symptoms of dyspepsia. The main treatment must generally be by diet, exercise, massage, pharmaceutic preparations, hydrotherapy, and mineral waters. Climatic treatment may, however, accompany or follow the other measures, and is often useful in very chronic cases and when there is much depression. In some of the worst of these cases it may be advisable to commence with sanatorium treatment. In this way, by the help of test-meals, test-diets, and similar methods of observation, the patient's peculiarities in digestion and metabolism may more readily be studied, the effects of different therapeutic measures may be watched, and all treatment, especially the dietetic regimen, may more readily and correctly be carried out. Such sanatoriums may advantageously be situated at mineral water and climatic health resorts, for mineral waters and pure air may sometimes be made to constitute an important part of the methods employed.

Chronic Digestive Disorders

In the selection of a health resort for chronic digestive disorders the quantity, the quality, and the preparation of the food must always be considered; this subject has already been alluded to in considering the question of 'diet at health resorts.' The nature of

the **drinking-water** is likewise of importance, since **hard water** favors constipation and biliousness in some persons. It has been suggested that hard drinking-water accounts for some of the constipation and biliousness in visitors to health resorts on, or at the foot of, the chalk downs of the south coast of England. **Exercise** must be regulated according to the strength of the individual, and may in many cases by itself effect a cure. Exercise, freedom from worry, and change of surroundings certainly account for much of the benefit derived by those suffering with digestive disorders from sojourns at health resorts, and for the fact that mere traveling or a holiday in the country are often sufficient to give relief. At the commencement of the holiday or the visit to a health resort a certain degree of abstinence from food is most important in many cases, especially when the stomach has previously been overworked by too frequent feeding. In these cases, unless there be some counterindication, the tired organs must be allowed healthful rest by long intervals between meals, and by selecting the blandest diet. Much self-control is often necessary at this stage, for the change of air and surroundings tends to increase the craving for food and stimulants; and the feelings of 'sinking' and 'lowness' in the gouty and dyspeptic are frequently mistaken by the patients as indications for taking food, stimulants, or tonic medicine. In some of these cases, however, frequent small meals of a nutritious but nonstimulating food, such as milk and its preparations, may have the desired effect; because by a milk diet the required amount of nourishment probably is obtained, although comparatively little work is thrown upon the digestive organs. By frequent meals of this kind the digestive organs may therefore receive rest, just as they may by the abstinence method. The latter is generally suitable for the stronger constitutions, and the milk diet method, for the weaker. The subject is discussed fully in the volume on "Dietotherapy."

Seaside resorts and sea air are not generally to be recommended for persons with dyspepsia and chronic catarrhal conditions of the alimentary canal, when it is suspected that these are connected with a gouty tendency or with habitual overindulgence in food and drink, or when they are associated with chronic congestion of the abdom-

inal viscera or with diseases of the liver or kidneys. In **gouty and plethoric cases** dry inland health resorts among hills or mountains at moderate or high altitudes¹ are usually preferable; here the metabolic processes are stimulated, the feeling of energy often increased, and good opportunities for climbing exercise afforded, according to the individual powers, while at seaside resorts a tendency to drowsiness, indisposition for exercise, and a condition of biliousness are sometimes engendered.

Various complications must be considered. Thus, when there is a tendency to dilatation of the heart, with or without valvular disease, high altitudes may be unsuitable, and dry inland resorts of moderate or low elevation should be given the preference. There should be facilities for pleasant walks on level ground and at various inclinations; many of the health resorts at moderate elevations in mountainous districts where the 'Terrain-Cur' is practised are admirably adapted for this class of cases. When **renal disease** is a complication, dry, warm climates are required, but the presence of slight traces of albumin in the urine in gouty, plethoric, and other cases does not necessarily affect the choice of a locality; the condition of the heart and circulatory system and the general condition of the patient will furnish evidence in regard to the probable significance of the albuminuria.

Dyspepsia

In some persons 'dyspepsia' forms only a manifestation of a condition, hereditary or acquired, of **weak mucous membranes**, with a tendency to catarrh. In regard to climate, the same management is required for these patients as for patients with a tendency to

¹ At high altitude resorts the respiratory movements are increased, first, owing to the rarefied atmosphere, and, second, owing to the fact that a certain amount of climbing exercise is usually undertaken. With each deep inspiration the abdominal vessels are compressed by the descent of the diaphragm and the contraction of the muscles of the abdominal wall. In fact, as has been pointed out by Moebius and others, a kind of gentle massage action is produced by which blood and lymph in the abdominal viscera are propelled onward, while the simultaneous expansion of the thoracic cavity tends to aspirate blood from the abdomen by the inferior vena cava and the hepatic veins. These considerations account for the good effects of high altitudes in some congested, not active inflammatory, conditions of the abdominal organs.

catarrh of the respiratory organs. To some extent one may succeed in 'hardening' them by judicious hydrotherapeutic processes and by moderately bracing sea air, or by mountain resorts during summer; but diet must always be regulated carefully, especially in regard to quantity; and in winter, warm, dry climates, such as the RIVIERA and EGYPT, will often be useful. Such cases are frequently associated with **neurasthenia**, which must be treated by general hygienic methods and the like. **Mental and nervous disorders** often constitute the main indications for treatment in patients who likewise manifest digestive disturbances. In many cases of long standing in town dwellers given to **overwork**, an ocean voyage, with its necessary relief from business cares and other worries, is successful; while in others, change to mountainous regions, with abundant open-air exercise, offers the best means for recovery.

Among the most suitable American resorts for dyspeptics are the POLAND SPRINGS, in Maine, SARATOGA (using the Vichy Spring), and RICHFIELD, in New York, CAMBRIDGE SPRINGS and BEDFORD SPRINGS, in western Pennsylvania, the WHITE SULPHUR SPRINGS, in Virginia, the NAPA SODA SPRINGS and SUMMIT SODA SPRINGS of California, and the OURAY, SPRINGDALE SELTZER, and MANITOU SPRINGS of Colorado.

Some chronic forms of disturbance both in the stomach and intestines occurring in oldish patients are really due to beginning senile changes affecting the functions of the digestive organs, and they must be treated accordingly. A quantity of food that formerly could easily be digested gives rise to pain or flatulence because it imposes too much work upon the weakened organs. The quantity taken must be reduced, and treatment such as that suggested under the headings of Old Age and Premature Old Age may be of use.

The action of different **mineral waters** in disorders of the digestive organs will be treated fully in the volume on "Hydrotherapy, Thermo-therapy, and Balneology." In dyspepsia associated with **chronic constipation**, aperient mineral waters, such as the various Hungarian bitter waters, are often useful, but constipation will be referred to further on. In irritation and chronic **catarrhal conditions of the stomach and intestines** the sulphated waters

of FRIEDRICHSHALL, HUNYADI JÁNOS, etc., and the sulphated alkaline waters of CARLSBAD, MARIENBAD, TARASP, and ELSTER are serviceable for stout and plethoric patients, especially when there has been habitual overindulgence in food. For weaker patients of the same class muriated or muriated sulphur waters, such as those of KISSINGEN, HOMBURG, HARROGATE, and LLANDRINDOD, may be selected. In America, among waters that may usefully be employed are the alkaline aperient waters of SARATOGA, New York, the alkaline earthy waters of WAUKESHA, Michigan, of CAMBRIDGE SPRINGS, Pennsylvania, the muriated sulphur waters of RICHFIELD SPRINGS, New York, and BEDFORD SPRINGS, Pennsylvania, the alkaline chalybeate waters of NAPA SODA SPRINGS, California. The judicious use of CRAB ORCHARD water is also useful in catarrhal conditions of the intestines associated with constipation. When there is a **gouty** tendency, the choice of mineral water health resorts must depend on the constitution of the patient. It is needless to say that in dyspepsia from **alcohol** or **tobacco** the main indication is the removal of the cause. For many dyspeptic patients with weak mucous membranes and in cases of '**nervous dyspepsia**' in excitable persons, often due to mental fatigue and insufficient sleep, simple thermal spas at various altitudes, in beautiful mountain valleys, such as WILDBAD-GASTEIN, WILDBAD in Wurtemberg, SCHLANGENBAD, PLOMBIÈRES, RAGATZ, and BUXTON, or, in America, certain of the various warm and hot springs of VIRGINIA, WEST VIRGINIA, NORTH CAROLINA, and CALIFORNIA may be recommended for a course of the thermal baths or suitable hydrotherapeutic methods. In **anemia** and **atonic dyspepsia** without excessive irritability or catarrh, an internal course of waters at chalybeate or muriated spas and possibly the use of effervescent or brine baths will often be suitable when associated with ordinary rational treatment. When there is **cardiac weakness**, with or without chronic valvular disease, a course of thermal muriated effervescent baths, such as those of NAUHEIM, is sometimes indicated. These baths may likewise be had at WATKINS, New York.

Habitual Constipation

For these cases treatment by diet, open-air exercise, abdominal massage, and pharmaceutic preparations is of great importance. In

overworked persons of sedentary habits, however, change of air to some dry inland health resort of moderate or high elevation, associated with outdoor exercise, according to the individual strength may be serviceable. For stout plethoric persons an internal course of mineral waters at one of the sulphated alkaline spas, such as MARIENBAD, TARASP, FRANZENSBAD, and ELSTER, will often do good and give relief from associated nervous disturbance and headaches. For weaker persons of spare habit of body, muriated spas such as KISSINGEN, SARATOGA, VICHY, etc., may be recommended instead.

It must not be forgotten that in some individuals the normal frequency of action of the bowels differs from the usual rule. There may ordinarily be regular or irregular intervals of several days, especially in women and feeble persons who eat little. The general health in these cases should be improved as far as possible by appropriate means, such as moderate open-air exercise, hydrotherapeutic measures, effervescent baths, brine baths, sea-bathing and tonic inland climates of moderate elevation. Interference by strong purgatives and by attempts to increase the peristalsis through the action of bulky meals and coarse, gritty food, may sometimes do more harm than good in these cases, by exhausting the sluggish bowel and setting up a catarrhal condition of the mucous membrane. In fact, it is probable that many headaches and other disorders associated with habitual constipation are really due less to the constipation itself than to catarrhal conditions of the intestine. These favor the passage from the alimentary canal into the circulation, of toxic substances that would not be absorbed were the mucous membrane free from catarrh.

Chronic Diarrhea

In each case of chronic diarrhea the causes must be sought out and dietetic treatment instituted. The intestinal catarrh that leads to frequent attacks of diarrhea with intervals of constipation is often the result of a **weak mucous membrane**, a condition to which we have already referred, and the treatment must be adapted accordingly. In cases of severe diarrhea with chronic intestinal catarrh prolonged rest in bed is most important, and treatment in these cases

can sometimes be carried out best at special sanatoriums. The waters and baths of PLOMBIÈRES have acquired a good reputation in cases of chronic diarrhea with weak mucous membrane, and may do good in some forms of so-called 'mucomembranous colitis.' In cases of chronic diarrhea and intestinal catarrh, health resorts noted for their good milk and milk preparations (see Book I) may sometimes be given the preference. ROCKBRIDGE ALUM and BATH ALUM SPRINGS, in Virginia, and IRONDALE and OLD SWEET SPRINGS, in West Virginia are useful by reason of the tonic astringent properties of their waters.

Some cases of chronic diarrhea and intestinal catarrh are associated with sluggishness of the portal circulation, and occasionally follow a period of overindulgence in food and insufficient exercise, or have been preceded by constipation. These cases are often benefited, and rarely cured, by very limited courses of aperient waters, such as those of CARLSBAD and KISSINGEN.

The treatment of chronic diarrhea due to colitis may be greatly aided by judicious selection of climates in America. From three to six months or a year may be required, and the patient should not spend his time in sight-seeing or in traveling. The station chosen should have a comparatively moderate temperature, neither too hot in summer nor too cold in winter, but as equable as possible, combined with great atmospheric dryness, a dry, porous soil, a clear sky, and little rain or snow. In addition, the advantage of good society, fine scenery, and opportunities for amusement should be sought. The most favorable localities for a summer residence are, for the milder cases, the shores of VIRGINIA, DELAWARE, NEW JERSEY, or LONG ISLAND. The best winter localities are the hills of NORTH CAROLINA, not beyond the elevation of ASHEVILLE, the coast of GEORGIA,—for example, BRUNSWICK and JEKYL ISLAND,—and various resorts in COLORADO and SOUTHERN CALIFORNIA. The Congress and Hathorn waters at SARATOGA, those of BALLSTON SPA, New York, BEDFORD, Pennsylvania, CRAB ORCHARD and HARRODSBURG, in Kentucky, LINEVILLE MINERAL SPRINGS, in Wayne County, Iowa, CALIFORNIA SELTZER SPRINGS, in Mendocino County, and EL PASO DE ROBLES, in San Luis Obispo County, in the same State, are suitable waters when such are indicated.

Hemorrhoids, Chronic Catarrh of the Rectum, and Pruritus Ani

Many of these cases are due in greater or less part to excess in eating and drinking and to insufficient bodily exercise. These causes will have to be avoided permanently, but a visit to some health resort is often convenient for temporary purposes and for improving the general health. Spas with sulphated alkaline waters, such as MARIENBAD, CARLSBAD, TARASP, FRANZENSBAD, and ELSTER, and muriated sulphated waters, as that of BRIDES-LES-BAINS, may be recommended in stout and plethoric subjects, and in many cases a course of treatment with sulphur waters, muriated sulphurous waters, or muriated waters may do good. In America, the SARATOGA waters, the ALLEGHANY SPRINGS, of Virginia, the CRAB ORCHARD SPRINGS, of Kentucky, the GENDA SPRINGS, of Kansas, and the BYRON SPRINGS and MT. PARAISO HOT SODA SPRINGS, of California, may be employed. Inland health resorts in mountainous districts at moderate and high elevations, with facilities for open-air exercise of various kinds, should be selected in preference to most other climatic stations. In autumn a 'grape cure' (see p. 251) at one of the health resorts noted for their grapes may be permitted if carried out under good medical supervision, with suitable limitation of diet. We do not, of course, refer here to cases of pruritus ani due to anal fissures, polypi, and other local conditions, in which surgical methods of treatment are indicated; or to cases in which the symptom is an incident of diabetes mellitus, or of an organic nervous affection.

AFFECTIONS OF THE LIVER AND BILE-DUCTS**Congestion and Enlargement of the Liver**

In congestion and enlargement of the liver due to alcohol, malaria, cardiac weakness, overeating, and general obesity, the use of alkaline, sulphated alkaline, or muriated waters is often useful, according to individual indications. Inland health resorts at moderate or low elevations, where a certain amount of open-air exercise can be obtained and much time can be spent in the open air, are generally preferable to seaside resorts. When cardiac weakness is in part the cause, a course of thermal muriated effervescent baths,

such as those of NAUHEIM, may be beneficial. Alcohol must be absolutely avoided, whenever it is suspected to be more or less the cause of the hepatic enlargement, as in early forms of cirrhosis of the liver. In chronic catarrhal jaundice and in convalescence from this condition, and in hepatic disorders resulting from malaria and long residence in tropic countries, a course of mineral water treatment at CARLSBAD (sulphated alkaline waters) is a very popular method; a course of other sulphated alkaline waters or of simple alkaline waters, as that of VICHY, or of muriated sulphur waters, as those of HARROGATE, LLANDRINDOD, BEDFORD SULPHUR SPRING, and MT. CLEMENS, is often equally beneficial.

Functional Disorders of the Liver

A great variety of complaints are undoubtedly more or less dependent on disturbance of the hepatic functions and insufficient action of the hepatic cells—that is, ‘hepatic inadequacy,’ or ‘sluggish liver,’ to employ a popular term. This is not surprising when we remember the important work done by this organ, the largest of the abdominal viscera, which is still sometimes spoken of as if its only business were the production of bile. Not to mention its glycogenic and ‘storehouse’ functions, it takes a chief share in forming urea and the end-products of nitrogenous metabolism, and it stands in the way to prevent injurious substances in the portal blood from entering unaltered into the general circulation. Indeed, some regard the bile as little more than a waste-product, which the liver has to get rid of in exercising its important metabolic functions. It can hardly be doubted that among affections more or less connected with functional disorder of the liver one may rightly include many cases of gastro-intestinal and ‘bilious’ disturbance, and many cases of ‘gouty’ glycosuria and of the slight albuminuria sometimes noticed during dyspepsia and temporary malaise, also many cases of troublesome pruritus, myalgia, neuralgia, headache, irritability and insomnia, and, as Burney Yeo holds, many cases of ‘irregular gout.’ The treatment of these conditions, at least so far as climates and health resorts are concerned, is mostly alluded to in other sections—for instance, in those on gouty conditions and on headaches. According to the special features of each case the

management must consist in regulation of diet, fresh air, avoidance of strong winds and chills, suitable muscular exercise, massage, deep respiratory movements, hydrotherapy, stimulating mineral water baths, and the internal use of mineral waters, especially those belonging to the aperient and alkaline groups. In regard to climate, cool inland summer resorts of moderate or even high elevation above sea-level, and tolerably sheltered from winds, are probably the most generally suitable. There should be pleasant hilly woodland in the neighborhood, with shady paths on the slopes for exercise in hot sunny weather. Seaside resorts,¹ especially those actually at sea-level, should generally not be selected, and must in some cases be altogether avoided. Often, however, situations on slopes or plateaus near the sea, but elevated a few hundred feet above it, are better tolerated. In any case patients of this class should be cautioned to be particularly moderate in their diet while staying at the seaside, and to keep their bowels open, if necessary, by the help of aperient waters, occasional mercurial purges, enemata, and similar means.

Cholelithiasis (Biliary Concretions)

The chief causes of cholelithiasis are, first, chronic inflammatory and catarrhal conditions of the biliary passages and gall-bladder, which, whether due to the local presence of microbes or not, give rise to an increased formation of cholesterin; and, second, delayed flow of bile. In order, therefore, to remove the causes of complaint, the circulation of blood in the liver may be accelerated by exercise, preferably in the open air, the flow of bile may be promoted by the ingestion of suitable quantities of liquid,—for instance, a tumblerful of warm or cold water night and morning,—and gastro-intestinal disorders, with the resulting irritation of the liver and biliary passages, may be remedied by appropriate diet, exercise, massage, local or general, aperients, mineral waters, and the like.

P. J. Moebius, from experience in his own person, has pointed out the value of the systematic use of **deep inspiratory movements**

¹ Compare F. P. Weber, "On the Biliousness Sometimes Induced by Sea Air," "Treatment," London, January 11, 1900.

in some forms of hepatic disorder. With each deep inspiration we know that the liver and other abdominal viscera are gently squeezed by the combined contraction of the diaphragm and the abdominal walls,¹ so that the movements of the blood and lymph and the flow of bile are all accelerated, while the simultaneous expansion of the thorax tends to aspirate blood from the inferior vena cava and the hepatic veins and thus also contributes in promoting the hepatic circulation. It is clear, therefore, that voluntary exercise and all methods that increase the inspiratory movements may be considered as a kind of preventive treatment of cholelithiasis. Among such means residence in hilly and mountainous regions, especially at high altitudes, must be included, for not only does the rarefied atmosphere of high altitudes increase the inspiratory movements, but the climbing exercise associated with the residence in mountainous districts has a similar and even a greater effect. When gall-stones have apparently been gotten rid of by spa treatment or by operation or otherwise, the principles of this preventive treatment to which we have referred, may be useful to prevent recurrence.

For cholelithiasis, various **mineral water health resorts** have attained a great reputation, especially CARLSBAD, with its warm sulphated alkaline waters, VICHY, with its simple alkaline waters, and, to a less extent, CONTREXÉVILLE, with its earthy waters. Larger quantities of the last water than of the two first mentioned are generally used. Muriated waters—*e. g.*, KISSINGEN, HOMBURG, and others—and muriated sulphur waters, as those of HARROGATE, LLANDRINDOD, BEDFORD, Pennsylvania, LAS VEGAS HOT SPRINGS, SHARON, WHITE SULPHUR, CALISTOGA HOT SPRINGS, California, MT. CLEMENS, Michigan, and FRENCH LICK SPRINGS, Indiana, are likewise sometimes employed. Mineral water treatment tends to dilute the bile and to counteract the tendency to catarrh of the bile-passages. As Lauder Brunton has pointed out, by rendering the bile thinner and less sticky, the shifting of biliary concretions is favored; that this is actually the case is evidenced by the statement of J. Mayer,² of Carlsbad, that attacks of biliary colic and the passage of

¹ At all events, when the inspiratory movement is of the thoracic type.

² "Verhandlungen des XVII. Congresses f. innere Medizin," p. 509, 1899.

gall-stones are frequent at Carlsbad. Such attacks of biliary colic, when associated with the passage of gall-stones or gall-sand, may in some cases permanently overcome the cholelithiasis, but in other cases, when the calculi are very numerous or of large size, this is impossible, and complete removal can then be effected only by operation. Even when the concretions cannot be removed by mineral waters, spa treatment may, nevertheless, give relief by allaying the associated tendency to inflammation in the gall-bladder and bile-passages, and by improving the circulation in the liver, and the general condition of the body. It is doubtless for this reason that Hans Kehr,¹ of Halberstadt, recommends a course at Carlsbad **after** operations for gall-stones. In many cases of chronic cholelithiasis it is impossible to decide whether a course of treatment at Carlsbad or other mineral water health resort will be useful or not, and in such cases the treatment may be given a fair trial before operation is resorted to. On the other hand, mineral water treatment cannot take the place of surgical operation in most cases of chronic obstruction in the common bile-duct, in cases in which the gall-bladder can be felt to be full of concretions, in cases of chronic cholelithiasis that have already resisted balneotherapeutic and other medicinal and physical treatment, and, of course, when acute suppurative inflammation has occurred in connection with the presence of biliary concretion.

¹ "Münchener medizinische Wochenschrift," September 20, 1898.

CHAPTER XIII

DISEASES OF THE URINARY ORGANS

Chronic Nephritis. Paroxysmal Hemoglobinuria. Urinary Gravel. Oxaluria. Phosphaturia. Calculi in the Kidneys and Bladder. Chronic Pyelitis and Chronic Catarrh of the Urinary Bladder. Chronic Urethritis and the Remains of Gonorrhea.

Chronic Nephritis

When the patient is in condition to travel, **warm climates** are to be recommended during winter. On account of the dryness of the air, health resorts such as ASSOUAN, HELOUAN, and MENA HOUSE in Egypt are usually to be preferred, but the relatively dry warm marine health resorts of the RIVIERA, or moister places, such as ALGIERS, are likewise suitable in many cases. In England, when the patient cannot leave home for the winter, one of the mild southwestern seaside resorts may be selected, such as BOURNEMOUTH and the more sheltered parts of TORQUAY and FALMOUTH. In America, CORONADO, PASADENA, and MONTEREY, in California, PALM BEACH, Florida, OLD POINT COMFORT, Virginia, and in individual cases, CAPE MAY, ATLANTIC CITY, and the warm, dry New Jersey resorts a short distance inland, as LAKEWOOD and HAMMONTON, are suitable. Some American physicians speak highly of the lower levels of Arizona (as YUMA, TUCSON, and PHOENIX), which are indeed warm and dry, but in the recommendation of which discrimination must be exercised. In the selection of health resorts, and likewise of dwellings in health resorts, the necessity of shelter from winds must always be taken into consideration. During summer a course of treatment at simple thermal or weak alkaline spas is sometimes recommended, and summer health resorts noted for their excellent milk and milk preparations, such as kumiss and kephyr, are often visited. The quantity of milk and mineral waters taken by patients with renal affections may, however, sometimes be excessive. Carl

von Noorden has recently pointed out that particular caution should be exercised in this respect in cases of **chronic interstitial nephritis**, especially when there is any tendency to dilatation of the heart. It may likewise be observed that the practice of selecting very dry, hot climates in preference to mild climates of medium humidity, partly with a view to sparing the patient's kidneys by encouraging evaporation from the body, and the practice of increasing the amount of fluid that has to be secreted by the kidneys, as is done when courses of mineral water and fluid diet are recommended, seem to be somewhat at variance with each other. A little more individualization is probably required in regard to both these points of treatment.

In the early stages of chronic interstitial nephritis in **gouty** subjects the climatic and balneotherapeutic treatment for the gouty condition ought to be adopted. In cases of **pulmonary tuberculosis**, high altitudes, which one might otherwise be inclined to recommend, are excluded by the presence of renal disease; suitable health resorts and sanatoriums at moderate and slight elevations are to be preferred, and the winters should, if possible, be passed in warm and dry climates at localities where adequate medical supervision can be obtained. In cases of chronic albuminuria complicated with **anemia**, chalybeate waters are not rarely useful.

In the **lesser and temporary forms of albuminuria** the cause may be dyspepsia or functional disorder of the metabolic organs rather than actual disease of the kidneys, and treatment by climate and mineral waters may sometimes be recommended in addition to dietetic and other means. In some of these cases merely the change of climate and surroundings may suffice to remove the albuminuria, just as it may remove temporary glycosuria and act beneficially in a number of other morbid conditions. Probably, in such cases, the relief from mental anxiety and overwork often plays a part in the results obtained from climatic treatment.

Paroxysmal Hemoglobinuria

Paroxysmal hemoglobinuria, although, strictly speaking, not a disease of the kidneys, may for convenience be mentioned in this

place. The paroxysms are certainly induced in some of these cases by fatigue and exposure to cold. Sir H. Weber knows of good results obtained from residence in warmer climates, such as the EAST and WEST INDIES and EGYPT; a trial of these may be recommended especially during the colder part of the year; malarious districts must, of course, be avoided. The presence of syphilis, which is sometimes associated with this affection, would probably not alter the climatic indications. Hemoglobinuria from malarial disease is frequently observed in Alabama, Mississippi, Louisiana, Arkansas, and, to a less extent, in Florida. While it differs in both etiology and pathology from the affection under consideration, yet the fact that Raynaud's disease has a connection both with paroxysmal hemoglobinuria and with paludal poisoning, suggests that patients should avoid the gulf coast of the United States and the lower Mississippi Valley.

Urinary Gravel

Under this heading we shall consider only uric acid gravel, the deposits of calcium oxalate ('oxaluria') and phosphates ('phosphatic gravel') being discussed under separate headings. The precipitation of uric acid and its salts in the urine, although pathologically allied to the deposition of gouty concretions of the joints, very often occurs quite independently of the latter; sometimes patients with articular gout never suffer from gravel,¹ and conversely. Uric acid gravel, however, like articular gout, occurs chiefly in persons who are large eaters and who take alcoholic stimulants freely, or who belong to gouty families. The arrangement of diet and regimen is essential. A proper amount of open-air exercise promotes oxidation in the body and must, obviously, be useful, although overexertion may be harmful by inducing excessive nitrogenous metabolism and increasing the amount of uric acid in the urine. Climatic health resorts similar to those recommended in gout should be selected. The neurasthenic condition or nervous irritability sometimes associated with uric acid gravel will probably

¹ In gouty persons it appears that there is often diminished excretion of uric acid.

be diminished by the freedom from sources of worry likely to be enjoyed at health resorts.

Mineral water health resorts are often recommended: the sulphated and sulphated alkaline springs for the stout and plethoric, especially when there is constipation; the simple alkaline springs when, owing to a tendency to diarrhea, the aperient sulphates must be avoided; in weaker constitutions the muriated, simple thermal, or earthy waters, such as those of CONTREXÉVILLE and WILDUNGEN. The waters of LUHATSCHOWITZ and VIDAGO are much employed as diuretic drinks, but sometimes the use of ordinary hot water or distilled water, or weakly mineralized table waters, such as APOLLINARIS, YOHANNIS, ROSBACH, GIESSHÜBLER, POLAND water, EQUINOX water, GLEN SUMMIT, etc., are sufficient, especially when taken night and morning. Water-drinking serves to dilute the urine by increasing the amount secreted, and the saline constituents of mineral waters, when they leave the body by the urine, tend to keep the uric acid in solution and prevent its precipitation in the urinary passages. Dr. S. Gee finds that a large teacupful of fresh whey taken after each meal suffices to prevent the appearance of uric acid gravel, as far as he has observed, even in persons long subject to it. In America the so-called lithia waters, and in consequence the resorts where they are found, as, for example, BUFFALO LITHIA, ELK LITHIA, and FARMVILLE LITHIA SPRINGS of Virginia, have considerable reputation. Whether or not the small quantity of lithium, or the larger quantities of other alkaline salts contained in these waters, are specially useful, the free use of hydrogen monoxid that their associated presence induces the patient to make, is of great service.

Before leaving the subject we would mention that by uric acid gravel we refer to deposits of uric acid in the urine occurring either before the urine is passed, which is relatively rare, or soon afterward. The copious precipitation of urates in the urine after standing and cooling, although doubtless an allied phenomenon, metabolically, is of much less pathologic importance, and hardly calls for special treatment unless it occurs very frequently or persistently, in which case faulty habits in regard to diet, regimen, etc., must be corrected. A mere deposit of urates in the urine on standing does not necessarily signify that the total excretion of uric acid salts is *in excess* of the normal.

Oxaluria

Oxalic acid may be produced from uric acid by oxidation, and the condition of oxaluria is frequently associated with that of uric acid gravel, so that the indications mentioned in the preceding section apply in a manner here. In persistent oxaluria with dyspepsia, the digestion and general metabolism, which are at fault, may often be treated by courses at mineral water health resorts, together with attention to regimen and diet. The alkaline earthy springs of CONTREXÉVILLE and WILDUNGEN, and in America the Bethesda and other springs at WAUKESHA, are often to be preferred, but sometimes the simple alkaline springs, as VICHY, and others, and the muriated alkaline springs, such as LUHATSCHOWITZ, etc., and, when there is constipation, the muriated springs, for example, KISSINGEN and HOMBURG, may be tried. When, owing to overwork and mental anxiety, the nervous system is chiefly at fault, mere change by traveling or by a sea voyage may be sufficient; or a stay at some quiet health resort, with or without balneotherapeutic or hydrotherapeutic treatment, may be recommended.

Phosphaturia

By this term is meant the passage of urine that, when passed, is already either turbid, owing to the precipitation of earthy phosphates, or actually contains 'phosphatic gravel.' The term does not imply that the total excretion of phosphates in the urine is necessarily in excess of the normal. Special treatment at health resorts is rarely required in these cases. The condition often occurs in students and men of sedentary habits, especially when overworked. In these cases a holiday in the country and exercise in the open air have the most beneficial influence on the disordered nervous condition, which is sometimes the main cause of persistent phosphaturia. Exercise probably acts also by improving the circulation in the stomach, and thus facilitating the return of the hydrochloric acid of the gastric secretion into the blood, and so diminishing the alkalinity of the blood and urine. Exercise such as fencing, riding, golfing, lawn-tennis, cycling, walking tours, and mountain climbing may free the urine from phosphatic deposits.¹ Hydro-

¹ Compare Brunton's "Lectures on the Action of Medicines," 1897, p. 540.

therapeutic measures, inland brine baths, and sea-bathing, recommended according to the general strength of the patient, may, by their tonic action, have a good effect. Sometimes an internal course of muriated waters at spas such as KISSINGEN and HOMBURG may act beneficially. Moderation in the amount of food is likewise important. POLAND SPRINGS, SARATOGA, VICHY, GENEVA LITHIA, GLEN SUMMIT, and LONDONDERRY LITHIA waters have been recommended.

Calculi in the Kidneys and Bladder

Under treatment by mineral waters, such as those of CARLSBAD, VICHY, VALS, VIDAGO, CONTREXÉVILLE, and WILDUNGEN, small calculi are occasionally passed in the urine. The best way, however, to prevent the necessity for surgical interference is to overcome the formation of the stones by opposing the tendency to uric acid gravel, etc., according to hygienic, dietetic, climatic, and other indications as set forth in preceding pages.

Chronic Pyelitis and Chronic Catarrh of the Urinary Bladder

Chronic pyelitis and chronic catarrh of the urinary bladder, not due to tuberculosis or the presence of a calculus, may sometimes be benefited by climatic or mineral water health resorts when selected according to general indications. In stout and plethoric persons the use of sulphated and sulphated alkaline waters, such as those of CARLSBAD and other spas, may be beneficial, especially when there is constipation, and in gouty subjects—the so-called ‘gouty cystitis,’ etc.—the alkaline waters, as those of VICHY, VALS, VIDAGO, etc., and the muriated alkaline waters, for example, LUHATSCHOWITZ, WAUKESHA, etc., may be serviceable. The earthy waters of CONTREXÉVILLE and WILDUNGEN probably owe their effects to the flushing out of the urinary passages. In these cases the diet must always be regulated, the ingestion of meat limited, and alcoholic stimulants and spices avoided so far as possible. Baths and hydrotherapeutic measures may be useful by promoting the activity of the skin. In regard to climates, cold and damp places and strong winds are to be avoided. During summer, dry, sheltered, inland localities at low or moderate elevations, and in winter a warm, sunny health

resort, for instance, on the MEDITERRANEAN or in EGYPT, may be selected. The FLORIDA resorts, and SANTA BARBARA and CORONADO, California, are to be included in the list of suitable American stations.

In these cases milk and milk preparations are important articles of diet, and during summer one of the European localities famous for their 'milk cures,' etc. (see Book I), may be chosen.

Chronic Urethritis and the Sequelæ of Gonorrhea

Gonorrhea, like various local infective processes, has a tendency to persist in a chronic form when there is an anemic or scrofulous tendency or when the general health is impaired in any way. A holiday and a change of regimen may exercise a beneficial effect in such cases of chronic gleet. The combination of rest with tonic open-air treatment obtained by long sea voyages is especially capable of doing good. Mineral water health resorts and hydrotherapeutic treatment may be employed according to individual indications. The health resort of WILDUNGEN, in the Principality of Waldeck, has considerable reputation in Germany in cases of chronic gonorrhea and urethral stricture, principally owing to the skilful local treatment practised there. When the urethritis is associated with gout,—so-called 'gouty urethritis',—the remarks made in regard to 'gouty' cases of cystitis and in regard to gouty conditions generally are to some extent applicable.

CHAPTER XIV

DISORDERS OF THE SEXUAL SYSTEM

Disorders of the Sexual System in Men. Disorders of the Sexual System in Women.

DISORDERS OF THE SEXUAL SYSTEM IN MEN

Diseases of the generative organs in men are not very amenable to climatotherapeutic and balneotherapeutic treatment. In cases due to tuberculosis and syphilis, the treatment, so far as climate and health resorts are concerned, has already been considered.

For excessive nocturnal emissions chalybeate spas and tonic climates may occasionally be recommended to anemic young men, but in most cases the ordinary general rules, such as active open-air life, healthy mental occupation, and the avoidance of any 'atmosphere of sexual excitement,' as the reading of certain books, certain theatrical entertainments, etc., and the avoidance of constipation, heavy bedclothing, and late meals and drinks are much more important.

In impotence and diminished sexual power connected with disordered states of the general health, the whole condition must be considered, and climate and health resorts may sometimes take a part in the treatment. Thus, when anemia, glycosuria, gout, chronic dyspepsia, cardiac weakness, and neurasthenia are concerned, the remarks already made on the treatment of these conditions have a bearing; urethral stricture requires, of course, local treatment. The recovery from temporary impotence following acute infectious diseases may be promoted by tonic climates, especially those of high altitudes, but it may persist when convalescence in other respects appears complete. In cases due to mental overwork, worry, and shocks, long holidays in suitable climates, with abstinence from all attempts at sexual intercourse, may be followed

by recovery in some cases, although in other apparently similar cases the function appears to have ceased, owing to a kind of premature senility. In the overworked and mentally depressed, long sea-voyages, when there is no counterindication, offer a good chance of success.

DISORDERS OF THE SEXUAL SYSTEM IN WOMEN

In **amenorrhea** due to anemia, climates and health resorts, as already indicated, often are useful in treating the anemia. In middle-aged women with a tendency to obesity and rheumatic or gouty pains, sulphated alkaline or alkaline waters and moor baths, such as those of **FRANZENSBAD**, may be beneficial, followed by residence in dry inland climates at moderate or high elevation.

In some cases of **menorrhagia** the congestive tendency in the abdominal viscera seems to be affected favorably by residence at high altitudes. In cases occurring in connection with chronic congestion and enlargement of the uterus, often due to subinvolution after childbirth or abortion, an extended course of treatment at muriated, muriated alkaline, or sulphated alkaline spas, followed or interrupted by residence at a climatic health resort of moderate elevation, often gives good results; in these cases, especially, is a prolonged period of rest for the organs required, the congestive tendency being certainly protracted by sexual intercourse. The mere separation from the husband during residence at a health resort may have a good effect. The menorrhagia associated with uterine fibroids is frequently favorably influenced by a course of brine baths, such as those of **KREUZNACH**, **WOODHALL SPA**, and **MT. CLEMENS**, in Michigan. In middle-aged women with a tendency to plethora and obesity, treatment at sulphated alkaline spas, such as **FRANZENSBAD**, with suitable regulation of the diet and regimen, may be recommended, especially when there is constipation, and should be followed by a stay at some climatic health resort of moderate or high elevation. When there is cardiac dilatation, thermal gaseous muriated baths, such as those of **NAUHEIM**, with or without resistance exercises, often are useful; high altitudes are counterindicated. Hydrotherapeutic measures and sea-bathing

sometimes are useful in cases requiring tonic treatment ; and chalybeate and arsenical spas may be prescribed in certain associations of anemic and debilitated conditions with menorrhagia.

Dysmenorrhea connected with chronic congestive conditions of the pelvic organs and subinvolution of the uterus may be treated by simple thermal baths, thermal baths of mud and peat, and other thermal baths at various health resorts, and by internal courses of muriated, muriated alkaline, and sulphated alkaline waters, the last especially when there is constipation. In America mud-baths with suitable medical supervision are found at LAS VEGAS HOT SPRINGS, in New Mexico, at MUDLAVIA, near Attica, Indiana, and at KLAMATH HOT SPRINGS, in California. Chalybeate and arsenical spas, associated with gentle hydrotherapeutic measures, may be useful when there is anemia. For delicate, thin patients of an irritable nervous constitution simple thermal spas during summer and warm climates during winter may be tried ; but the condition in these 'neurasthenic' subjects is often very intractable, and in some cases may be more or less persistent through the whole period of sexual life. An open-air life, with suitable occupation and muscular exercise, but with the avoidance of physical and mental overexertion, may do much good, and this may be rendered possible by selecting warm climates for winter residence, where much time can be spent in the open air. It is probable that proper attention to the physical development of growing girls by encouraging open-air exercises and games, for example, walking, cycling, riding, swimming, rowing, lawn-tennis, and the like, and the prevention of all overexertion, and especially of too prolonged indoor occupation, have a preventive action in regard to the neurotic forms of dysmenorrhea.

In leukorrhea, chronic metritis and endometritis, and the lingering effects of perimetritis and parametritis baths and spa treatment are very frequently employed, but on this subject we must refer the reader to the volume on "Hydrotherapy, Thermo-therapy, and Balneology." Some of the remarks previously made apply likewise here. In the selection of health resorts for this class of cases the presence of any special con-

stitutional tendency, as to anemia, to scrofula, to gout, or to obesity, must be duly considered.

Habit of Abortion and Sterility

In all cases, of course, such causes as anemia, syphilis, the presence of endometritis, and a chronically congested state of the uterus must be looked for, and in some cases spas and climates may take a share in the removal of such causes. It is hardly necessary to refer to the necessity for rest and the avoidance of mental excitement when there is a tendency to abortion, and the possible advantages of a quiet health resort in such cases. Repeated courses of the NAUHEIM treatment, assisted by prolonged rest for the uterus, have apparently overcome the tendency to miscarriage (H. Weber) in cases associated with dilatation of the heart. In sterility, balneotherapeutic treatment, for instance, at EMS, in Germany, and at HEALING SPRINGS, in Virginia, may sometimes have a directly favorable local action by curing leukorrhea, endometritis, and kindred affections, and thus correcting the acidity and abnormal qualities of the secretion by which the spermatozoa are destroyed. The relief of the constitutional disorder and the improvement of the general health may account for the good result of visits to health resorts in many cases. Sir H. Weber has seen good results follow treatment by various climates and mineral water health resorts, and is inclined to attribute them to the improvement in the general health of the patients, to the long separation from the husbands and the consequent rest of the sexual organs, and to increased vigor, due to abstinence, on the part of the husbands.

Disorders of the Menopause

This subject has already been referred to under the heading Climacteric Period in Women.

CHAPTER XV

DISEASES OF THE NERVOUS SYSTEM

Epilepsy. Hysteria. Hypochondriasis. Mental Depression. Neurasthenia. General Paralysis. Tabes Dorsalis. Neuritis and Neuralgias. Backache. Graves's Disease. Goiter. Myxedema. Diabetes Insipidus. Spasmodic Asthma. Chronic or Recurrent Headaches. Disorders of Sleep.

The majority of **organic affections of the nervous system**, such as **hemiplegia** resulting from cerebral hemorrhage and thrombosis, and **paraplegia** due to myelitis, can seldom be improved to any extent by climates and health resorts ; but the powers of resistance in this class of patients are generally lowered, and they often require the protection of warm winter resorts. The general health in old hemiplegic cases requires special attention, and a tendency to circulatory disturbances can sometimes be influenced favorably by a judicious course at mineral water health resorts during summer. A certain amount of exercise in these cases is important for maintaining the activity of the various organs, but the amount and the kind of exercise require individual consideration. The simple thermal baths are beneficial by improving the general health and regulating the circulation, and in a similar way the weak thermal muriated baths of BOURBON-L'ARCHAMBAULT, in France, have acquired much reputation. The sulphated and sulphated alkaline waters have a certain amount of **preventive value** when employed in plethoric persons in whom a tendency to apoplexy is suspected. For patients with a slight degree of paraplegia, mineral water health resorts are sometimes employed according to individual indications, with a view to promoting the general health, and the baths of OEYNHAUSEN have acquired a reputation in such cases.

In regard to insular sclerosis and lateral sclerosis there is nothing special to be said. Tabes dorsalis and general paralysis will be referred to further on. In the lingering effects of **infantile paralysis**,

tonic treatment by brine baths and sea air may sometimes be useful. When organic diseases of the nervous centers are due to active syphilitic changes, treatment at certain mineral water health resorts, as already discussed under the heading 'Syphilis,' may in certain cases have advantages over the ordinary treatment at home.

Epilepsy

Here needs merely to be said that quiet rural life with suitable occupation for the mind and body in a healthful, not too stimulating, inland locality is to be preferred. Sanatoriums and homes for epileptics in suitable country districts have the advantage that the patient is kept under medical supervision, that suitable occupation is provided, that the value of drug treatment in the individual case can more readily be estimated, and that severe accidents during the occurrence of the fits are less likely to occur in the grounds of such institutions than in the crowded thoroughfares of large towns and when the patient is left completely to himself. For the poorer classes, 'homes' and 'colonies' for epileptics have the additional advantage that the patient may be taught a trade and put in the best way of earning a livelihood.

Hysteria

In young patients with a hysteric tendency, mental overwork and town life are often most injurious. Localities in the country should be selected, according to the patient's constitution, where a quiet life may be led and the patient be kept employed for the greater part of the day at some open-air occupation. Children of hysteric and nervous stock should be reared in the country, given healthy open-air occupation, and their powers of will and self-control encouraged.

In hysteric persons, such associated conditions as dyspepsia, constipation, and anemia, when present, may be treated by the measures mentioned under these headings. Functional nervous disorders in torpid individuals without irritability, may sometimes be benefited by the judicious use of sea air and sea-bathing or by tonic hydrotherapeutic treatment. When there is a condition of **irritable weakness** of the nervous system, a course of treatment during

summer at some simple thermal spa, such as SCHLANGENBAD and PLOMBIÈRES, may sometimes be recommended, and, during winter, a resort sufficiently warm and sheltered to permit much time to be spent in the open air. A suitable resort in the United States is found in HOT SPRINGS, Virginia ; the waters of the Healing Spring near by, are almost identical with those of Schlangenbad.

Hypochondriasis

Conditions in which a patient is depressed and absorbed in his own real or imaginary ailments are often very hard to treat. His thoughts constantly revert to himself and his peculiar feelings, and the significance he attributes to them. Such a patient requires constant reassurance by persons in whose opinion he has confidence, and he is happiest when he is within easy reach of such persons. In the selection of health resorts for these patients the personal influence of the local physician must especially be considered. Diversion in traveling with judicious friends and encouragement in an absorbing occupation are among the best means of treatment. In every case a search must be made for some physical condition that may be disturbing the general health, and, when present, disorders such as constipation, hemorrhoids, dyspepsia, or a gouty tendency, may to some extent be remedied by health resorts, according to the indications already mentioned under the proper headings.

Mental Depression

Mental depression, especially when it is caused by overwork or the debilitating effects of influenza and other infectious diseases, is frequently benefited by change of climate. In some cases the treatment is merely that already referred to under 'Convalescence.' In overworked persons of strong constitution, mental depression will often disappear as a result of a prolonged stay in mountain climates. For weaker persons, lower elevations in mountainous districts may be recommended for the summer, and, during the colder months, resorts such as CASTELLAMMARE-DI-STABIA, SORRENTO, and AMALFI in southern Italy, and various resorts in SICILY, on the RIVIERA, and in SPAIN ; and sometimes still warmer climates,

such as ALGIERS, EGYPT, the CANARY ISLANDS, the AZORES, and the east coast of FLORIDA. In special cases, some of the resorts in ARIZONA and SOUTHERN CALIFORNIA can likewise be recommended. Mere change of scene and surroundings often is useful, such as is obtained by traveling among places of historic interest or by a winter spent in ROME, FLORENCE, VENICE, or ATHENS. For American patients who cannot cross the Atlantic, visits to WASHINGTON, RICHMOND, OLD POINT COMFORT, CHARLESTON and AIKEN, South Carolina, SAVANNAH, Georgia, NEW ORLEANS, ST. AUGUSTINE, Florida, BERMUDA, KINGSTON, in the Island of Jamaica, HAVANA, and a tour of the WEST INDIES may be advised during the winter and spring. For the summer, the trip to the YELLOWSTONE PARK, the YOSEMITE VALLEY, and then along the coast of ALASKA, affords healthful diversion. A delightful spring trip is that across the Pacific to JAPAN, with judicious journeys and prolonged sojourns at points of scenic, artistic, or other interest. Needless to say, whenever a tendency to suicide is suspected, the patient must be accompanied by proper attendants, whatever climatic advice be given, and in such cases sea voyages should not be recommended.

Neurasthenia

The symptoms and exciting causes of neurasthenia vary too widely and form too large a subject to permit discussion here. Prolonged change of climate and surroundings is generally of great importance in the treatment, and a sea voyage is often useful. ALPINE resorts, CANADA, the ADIRONDACK Mountains, and the woods and shores of MAINE may be recommended during the summer, and in winter too, when the general strength is fairly good. In weaker individuals, the winters, at all events, should be spent in warmer climates. The outlook for obtaining a good result is perhaps brighter when the neurasthenic condition has followed recognizable mental overwork or excessive worry or anxiety of some kind, than when it occurs without any very obvious exciting cause. In all cases, however, it should be remembered that the affection is a chronic one and demands a very long time—sometimes years—for its treatment; also that the condition is, as the name 'neurasthenia' signifies, one of debility of the nervous system; that, therefore, all

causes of mental fatigue and excessive excitement are absolutely counterindicated. Attempts 'to work off the depression' by going out to dinners and to social entertainments, which are sometimes recommended by the patient's friends, may be most injurious, and in some cases even the exertion and excitement of gentle traveling may be too much for the nervous system. Rest on a couch during part of the day is advisable in many cases, and this may be carried out with advantage in association with a modified 'open-air cure,' as it is at many of the sanatoriums for the treatment of pulmonary tuberculosis. A modified 'Weir-Mitchell treatment' may likewise be combined with open-air treatment in some of these cases. The subject is more fully discussed in the volumes on "Rest" and on "Mechano-therapy."

General Paralysis

In a hasty examination, the early symptoms of general paralysis of the insane may sometimes be mistaken for hypochondriasis or neurasthenia. In cases of general paralysis, however, change of climate is not likely to be of much good, and it is quite possible that the excitement of voyages and traveling may sometimes accelerate the progress of the disease.

Tabes Dorsalis

This disease, although undoubtedly generally due to syphilis as a predisposing cause, is often excited by overfatigue and exposure to cold and wet weather. In some instances (Sir H. Weber) that have remained stationary for more than twenty years the use of thermal baths in summer, and yachting during winter in sunny climates, including the Nile, seem to have acted beneficially. The so-called lightning pains and other pains and paresthesias of tabes are certainly not rarely mitigated by simple thermal spas and hydrotherapeutic treatment. Very hot baths seem to be counterindicated in most cases, but the moderately warm baths of LAMALOU, in France, and of OEYNHAUSEN, in Germany, have obtained a considerable reputation. Occasionally, antisyphilitic measures, such as mercurial inunction combined with thermal baths and douches, as carried out at AIX-LA-CHAPELLE, HOT SPRINGS of Arkansas, LAS VEGAS Hot Springs,

GLENWOOD SPRINGS, and other health resorts, yield good results. The methodic muscular exercises introduced into the therapeutics of tabes by Dr. Frenkel, of HEIDEN in Switzerland, are acknowledged often to be of some use in diminishing the amount of incoordination, and are now employed at various health resorts to which this class of patients resort. This treatment, when adopted in favorable chronic and quiescent cases, causes the patients to overcome in a measure their ataxia by making more use of what is left to them of their muscular and other senses ; patients may in this way also regain control over their movements by gradually learning the correct interpretation of some of their altered muscular sensations. In this method of treatment, however, as well as in baths and hydrotherapeutic processes, all fatigue must be avoided absolutely. Prolonged stays at climatic health resorts of moderate elevation, such as ST. BEATENBERG, GURNIGEL, LES AVANTS, CHATEAU D' OEX, BEDFORD SPRINGS in Pennsylvania, and various points in the APPALACHIAN mountain chain, or in the COAST RANGE of the Pacific region of North America, generally exercise some beneficial effect.

Neuritis and Neuralgias

In cases of **peripheral neuritis** following infectious diseases, such as typhoid fever, health resorts selected according to the patient's constitution and the season of the year may favor convalescence from the infectious disease, while the careful use of simple thermal baths, and thermal sulphur baths, and douches, and massage, may be of use in promoting recovery from muscular atrophy and contractures due to the peripheral neuritis.

'Sciatica,' 'brachialgia,' and similar ¹ affections involving other nerves are generally due to a kind of neuritis, and although the motor nerve-fibers are not, as a rule, sufficiently involved to produce paralysis, a severe attack is frequently associated with a certain degree of muscular atrophy, anesthesia, various paresthesias, and alterations in the deep reflexes. In all the severer

¹ It is, perhaps, the custom to speak of cases as 'sciatica' even when nerves of the lower extremities other than the great sciatic nerve are affected, perhaps even when other nerves are alone affected. 'Brachialgia' is the general term for analogous affections of nerves in the upper extremities.

forms rest is required at first, and massage, douche massage, and forcible douches must be abstained from absolutely, during the acute period. After the acute stage is over, the patient may be advised to visit health resorts where hot mineral water baths can be obtained or treatment with hot water by other methods is available.

The simple thermal waters, the thermal muriated waters, the thermal sulphurous waters, and the thermal muriated sulphurous waters are very frequently employed for baths and douches in these cases, but cold muriated and other waters artificially heated are likewise made use of. Hot douches, alternating ('Scotch') douches, and the douche massage form a chief part of the treatment at many health resorts. The applications may be confined to the affected part, or, although specially directed to this part, may likewise be applied to other parts of the body, in order that a greater constitutional effect may be derived from the treatment. Among the many health resorts at which such methods of treatment are provided may be mentioned AIX-LES-BAINS, AIX-LA-CHAPELLE, URIAGE, BOURBONNE, HARROGATE, BATH, WILDBAD-GASTEIN, WILDBAD in Wurtemberg, BADEN-BADEN, RAGATZ, and BADEN in Switzerland. At HOT SPRINGS, Virginia, WHITE SULPHUR SPRINGS, West Virginia, at SHARON, RICHFIELD, and GLEN SPRINGS, New York, at GLENWOOD, Colorado, and at KLAMATH HOT SPRINGS, California, there are excellent facilities under medical supervision. It is hardly necessary to refer to the local hot vapor baths, hot-air baths, and the electric-light forms of hot-air baths ('radiant heat baths'), that are usefully employed at many health resorts.

A constitutional gouty tendency is frequently present in cases of sciatica, etc., and may be treated by climates and spas according to the indications given under the heading 'Gout and Gouty Conditions.' The eliminative action of balneotherapeutic and hydrotherapeutic treatment in various neuralgic cases certainly plays a part in the results obtained. It must not be forgotten that sciatic neuritis, especially if bilateral, may indicate the existence of **diabetes mellitus**.

The severest and most typical forms of **trigeminal neuralgia** ('**tic douloureux**') are not likely to yield to treatment by climates and health resorts, and permanent cure seems to be rare even

by the most radical surgical treatment. In the ordinary minor forms of **facial neuralgia** a constitutional predisposing cause, such as anemia or debility following overwork or acute diseases, is frequently present, even when some obvious peripheral exciting cause, such as a decayed tooth, is discovered. Treatment by climates and health resorts (see under headings 'Anemia and General Debility,' 'Convalescence from Acute Diseases') is frequently useful in these cases, although, of course, any exciting cause of the neuralgia, when present, should be remedied. Neuralgia of the supra-orbital division of the trigeminal nerve, when it is associated with chronic malaria ('brow ague'), may sometimes be benefited by treatment at chalybeate and arsenical spas and by prolonged residence at climatic health resorts of high altitude. (See heading 'Chronic Malarial Affections.')

We may here add that in regard to climatic and balneotherapeutic treatment, as well as other methods of treatment, it is important to distinguish ordinary cases of neuralgia and paresthesias without central nervous diseases from cases due to tabes dorsalis and organic affections of the central nervous system.

For neuritis and neuralgias a visit to the **GREENBRIER WHITE SULPHUR SPRINGS** in West Virginia, the **WARM SPRINGS** of Virginia, the **HOT SPRINGS** of Arkansas, **CASTLE CREEK HOT SPRINGS**, of Arizona, or **KLAMATH HOT SPRINGS**, California, may be advised.

Backache

Backache, chiefly of the sacral region, is a very common complaint in women with disorders of the pelvic viscera and chronic constipation. Appropriate treatment at mineral water health resorts may sometimes be of use by relieving the chronic constipation and counteracting the tendency to congestion of the pelvic viscera. Anemia is frequently a predisposing cause of 'backache,' and we refer to what has been said under that heading.

Graves's Disease, Basedow's Disease, or Exophthalmic Goiter

For most cases and for all the acute and severest forms, perfect rest and quiet are indispensable, and removal to health resorts is

not to be advised. In chronic cases, however, residence in elevated regions sometimes gives good results. S. E. Solly¹ believes that any undue exertion is more likely to have an unfavorable effect on patients with Graves's disease at high altitudes than at low ones; but if fatigue is avoided, a residence extending over many months and years not rarely exercises a curative influence.

In mild forms of Graves's disease and in allied vasomotor disturbances, the soothing effect of treatment at simple thermal spas, such as SCHLANGENBAD, HEALING SPRINGS, Virginia, and similar resorts, and the tonic effect of gaseous thermal muriated baths, as obtained at NAUHEIM and elsewhere, may be beneficial, and the removal from the excitement and worries of home life is often likely to aid the spa treatment. In some minor forms and in chronic cases the careful use of hydrotherapeutic measures, massage, Swedish gymnastics, and Schott's resistance exercises may likewise be employed, according to individual indications. The lesser symptoms of Graves's disease connected with various temporary conditions of the sexual organs in women, require generally no special treatment by climates or mineral waters.

Goiter

Ordinary goiter is mentioned next to exophthalmic goiter for convenience. It has been suggested that the comparative immunity of seaside places is due to the inhalation of minute quantities of iodine salts derived from the spray of sea-water in the air. The 'want of iodine theory' of goiter, as originally suggested, has been disproved, but some indirect action of iodine salts is generally acknowledged, and pharmaceutical preparations of iodine are extensively employed in the treatment of the disease. Some iodine-containing mineral waters had formerly a reputation against goiter, and that of the Tassilloquells of HALL, in Upper Austria, was known as the 'Haller Kropfwasser' ('goiter² water' of Hall); similarly the waters of ROTHENBRUNNEN in Switzerland have an established

¹ "Transactions of the American Climatological Association," vol. XIII, p. 245.

² Unless, indeed, the German word 'Kropf' was formerly often used to signify not goiter, but scrofulous glands in the neck and under the jaw.

local reputation in the treatment of cretinoid and backward children. Renewed attention has been given to the possible therapeutic action of minute quantities of iodine¹ compounds since the discovery by E. Baumann, in 1896, of thyroiodin ('iodinthyrin'), as the active principle to which the substance of the thyroid gland owes at least part of its power against myxedema and cretinism. In this connection it is interesting to note that the iodine found in traces in sea air appears, according to the researches of Armand Gautier, to exist there in organic combinations, and may belong to minute organisms or fragments of organisms held in suspension in the air. Practically speaking, however, all that need be said on the climatic treatment of goitrous patients is that they should reside in a locality where goiter is not endemic, and where they can obtain good drinking-water and an abundance of light and sunshine.

Myxedema

Myxedema is likewise for convenience mentioned here. A warm, sunny, not relaxing climate would undoubtedly be indicated for these patients were it not that the recent discovery of the specific effect of thyroid treatment has rendered climatic measures quite subordinate in almost all cases. In regard to infantile myxedema (cretinoid conditions), it is interesting to note that the waters of ROTHENBRUNNEN, in Switzerland, containing small amounts of iodine and iron, have, as already mentioned, enjoyed an old, well-attested, local reputation in the treatment of cretinoid and 'backward' children.

Diabetes Insipidus

When this form of polyuria is merely functional, climatic health resorts and simple thermal spas at high elevations may have a beneficial effect, owing to their tonic influence upon the general health and the functions of the nervous system. Chalybeate and arsenical spas may likewise sometimes be useful when there is

¹ In the same way that fresh interest has been given to minute quantities of arsenic in mineral waters since the discovery by Armand Gautier, in 1899-1900, that arsenic in organic combination is a normal constituent of the thyroid gland, and even of some other parts of the body.

anemia. Suitable American waters are those of the SWEET CHALYBEATE SPRINGS in Virginia, the WAUKESHA MINERAL SPRINGS of Wisconsin, and the Neptune Spring at GLEN SPRINGS, Schuyler County, New York. The last-mentioned spring, however, is only for external use, as it is a strong brine of calcic and sodic chlorid with iodine and bromine. The Deer Lick Spring at Glen Springs is a ferro-iodobromomuriated spring, and may be used internally to promote tissue metabolism and increase of the red corpuscles. The water is rich in carbonic acid and possesses tonic, alterative, diuretic, and mildly aperient qualities. The bromine-arsenic springs near CRUMPLER, Ashe County, North Carolina, are valuable in the anemias, but they are almost inaccessible in the mountains. The waters are shipped for sale.

Spasmodic Asthma

This affection has already been considered under Diseases of the Respiratory Organs.

Chronic or Recurrent Headaches

There are many different causes of headache, and some of them may be remedied by climates and health resorts. In headaches due to anemia and causes of debility, such as long-continued leukorrhea, treatment at chalybeate, muriated, and simple thermal spas, and, in mild cases, climatic resorts of high altitude, are often beneficial. (See the indications already mentioned under the heading 'Anemia and General Debility.') Health resorts may be useful in the headaches following influenza and other infectious diseases, as indicated under the heading 'Convalescence from Acute Diseases.' In gouty and so-called 'rheumatic' subjects suffering from headache, dry inland climates of medium elevation may frequently be useful during summer, and warm, dry resorts, such as EGYPT, during winter. In America, no climatic resort comparable with those of Egypt has been properly developed, but in the southern States, AIKEN, South Carolina, THOMASVILLE, Georgia, and PINEHURST, North Carolina, or in the North, LAKEWOOD, and HAMMONTON, New Jersey, and in the Pacific coast region, REDLANDS, California may be mentioned as types of available stations in the United States. Ari-

zona is dry and warm, and in certain cases TUCSON or PHOENIX may be commended for winter residence. The eliminative methods of spa treatment, associated with judicious regulation of diet and exercise, may often be of use. (See under heading 'Gout and Gouty Conditions.') Dyspepsia, catarrhal conditions of the alimentary canal, and constipation are frequent causes of headache, and may be treated on the principles suggested under the respective headings. Other abdominal disorders, such as imperfect action of the liver and kidneys, may, by producing a toxemic condition, give rise to headaches. These cases must be treated on general principles, but in the milder forms, climates, baths, and mineral waters are serviceable by their eliminative action, and in certain instances warm, dry, winter climates diminish the functional strain thrown on the affected organs. The reflex irritation set up by chronic affections of the pelvic organs is not rarely a cause of headache. Chronic congestion of the pelvic viscera appears sometimes to be relieved by a residence at high altitudes, and this treatment may overcome the headache in certain cases, although at the same time aperient remedies must occasionally be called into service. For climatic indications with regard to the headaches associated with dysmenorrhea the reader is referred to the heading 'Disorders of the Sexual System in Women.'

Many headaches seem to be due partly to venous congestion within the cranium and to imperfect aeration of the blood, and partly to a toxemic condition from defective metabolism and imperfect elimination. Insufficient muscular exercise and indoor occupations, with mental strain and overindulgence in food, frequently produce headaches of this class. The obvious treatment in such cases is to limit the diet and increase the amount of open-air exercise by walking, riding, cycling, lawn-tennis, and the like. In these cases open-air exercise exerts its beneficial effect not only by promoting the aeration and circulation of the blood, but by improving metabolism, lessening the production of abnormal metabolic products, and favoring the oxidation of toxic substances in the blood. In fairly strong subjects of this class a holiday in mountain districts of medium and high elevation, with judicious climbing exercise, has an admirable effect; and in many cases an

ordinary walking tour is all that is required; care must, of course, be taken to avoid overexertion at the beginning. In stout and plethoric persons of the same class, who, owing to indolence or obesity, cannot readily obtain sufficient ordinary open-air exercise, a course of treatment at sulphated alkaline spas, such as MARIENBAD, CARLSBAD, TARASP, ELSTER, RICHFIELD SPRINGS, New York, and BEDFORD, Pennsylvania, may be recommended, especially when there is a tendency to constipation; the spa treatment in these cases may often be combined with massage and Swedish gymnastics with advantage. In other cases when the state of the cardiovascular system is not quite perfect, similar methods may be recommended, sulphated alkaline spas being chosen for the stronger patients, and muriated spas, such as KISSINGEN and HOMBURG, for the less robust subjects. Headaches associated with chronic asthma, chronic bronchitis, and dilatation of the heart belong more or less to this group in regard to the exciting causes of the pain, but for the treatment we must likewise refer to what has already been said in discussing disorders of the respiratory and circulatory systems.

In headaches connected with chronic alcoholism and the habitual abuse of tobacco, the treatment of digestive disturbances, together with abstention from the exciting cause, is indicated; simple thermal baths and climates of moderate altitudes during summer, and warm, dry winter resorts may sometimes be useful when it is suspected that the alcoholism has already led to chronic changes in the brain or meninges. LAKEWOOD, New Jersey, easily reached from New York and Philadelphia, affords a dry and moderate winter climate and has good hydrotherapeutic facilities. For the class of cases just described treatment during the late autumn, winter, and spring can be carried out satisfactorily at this resort. ST. AUGUSTINE, Florida, is also equipped with a similar establishment open during the winter months.

Migraine (sick headache, bilious headache) is not rarely relieved by improvement of the general health, with rest from brain-work and an open-air life at climatic health resorts. This is especially the case when the migraine has been induced or aggravated by

mental overwork, sedentary indoor life, and a diet too highly nitrogenous. Mountainous climates of medium elevation, with a moderate amount of climbing exercise and much time spent in the open air, often are to be recommended; but in some persons, especially when there is habitual constipation, a course of treatment at sulphated alkaline spas, for plethoric subjects, or at muriated spas, for less robust subjects, ought to precede the climatic treatment. Limitation of meat and alcohol must generally be insisted on, and in many cases a tendency to migraine may be treated according to the suggestions given under the heading 'Gout and Gouty Conditions.' In the view of the editor¹ certain cases of migraine are closely allied to the symptom complex bearing the name of Graves, while others belong to the group described by Raynaud. At all events, in the climatic and balneologic treatment of migraine, as well as in its medicinal management, not alone must due attention be given to removal of exciting causes, and correction of underlying constitutional defects or aberrations, but the distinction between the congestive or parietic, and anemic or spastic, cases or attacks should also be taken into account.²

Chronic headache or the tendency to headache following excessive mental work, shock, worry, and insomnia, is often relieved by climates and health resorts. Inland localities at medium elevations, as SARATOGA, SHARON, or RICHFIELD SPRINGS, New York, may be recommended at first, and higher elevations afterward. The amount of exercise must be limited until the general condition begins to improve; afterward climbing exercise is frequently useful if the organs of circulation are healthy. In a great number of cases, especially in men who are 'good sailors,' a sea voyage answers admirably and has the advantage of effectually getting rid of the fatigue of reading and answering letters.

¹ *Vide* "Vasomotor Ataxia," "American Journal of the Medical Sciences," February, 1894.

² As a confirmation of clinical diagnosis the experiment suggested by Weir Mitchell of giving the patient amyl nitrite to inhale, may prove useful. Similarly the editor has found the experimental administration of thyroid extract on the one hand, and adrenal extract on the other hand, afford an additional means of discrimination.

Neurotic, neurasthenic, or nervous headache is a convenient term for a chronic or recurrent headache for which there may be no obvious exciting cause, but which is sometimes originally started by overwork, worry, insomnia, or acute diseases, especially in persons of weak constitution and of a nervous temperament. This headache may be intermittent at first and become persistent afterward. A judicious change of climate, together with change of social surroundings, is likely to have a good effect if persisted in for a long time. Simple thermal spas at moderate elevations, such as GASTEIN, WILDBAD, BUXTON, SARATOGA, SHARON, RICHFIELD, etc., may often be selected for the summer, and warm, equable climates for the winter, but no fixed rules can be laid down, and more bracing places may be preferable in some instances. Careful hydrotherapeutic treatment is also useful at times.

Disorders of Sleep

Defective sleep, or chronic insomnia, is due to various causes. Long-continued brain-work and anxiety are among the most frequent. In these cases the insomnia may at first be voluntary,—*e. g.*, sitting up late while engaged in literary or scientific work or to nurse sick persons,—but may after a time become a disagreeable habit, and one difficult to break. In fairly strong persons residence at high and medium altitudes, such as the ENGADINE, RIGI-SHEIDECK, GURNIGEL, ST. BEATENBERG, or, in America, COLORADO resorts, MT. LOWE, or colder stations such as MT. KINEO, may quickly drive away the insomnia; for weakly persons a course of treatment at simple thermal spas of medium elevations during summer may be recommended, and a warm climate such as the coast of CALIFORNIA, FLORIDA, BERMUDA, HAVANA, ALGIERS, EGYPT, the BAY OF NAPLES, or the RIVIERA, especially GRASSE, during winter. A judicious course of hydrotherapeutic treatment at one of the numerous health resorts where this can be obtained is often all that is required. If the sufferer be a man and a ‘good sailor,’ a long sea voyage may be the most agreeable and the most efficient mode of treatment.

For cases of insomnia connected with anemia and general debility, convalescence from acute diseases, and neurasthenia, we must refer to these headings.

Other cases of insomnia are due to dyspepsia, intestinal catarrh, and constipation, and for the treatment of these causes these headings may be consulted, while the treatment in another class of cases is that for asthma, chronic bronchitis, and dilatation of the heart. For the disturbed sleep and restlessness sometimes associated with the degenerative changes of old age, we refer to the heading Old Age and Premature Old Age.

Obvious exciting causes of insomnia, such as late meals, too late mental work, sleeping after meals during the day and in the evening, pruritus, with or without cutaneous eruptions, and the abuse of tea or coffee, when present, must, of course, be avoided, so far as possible.

The amount of sleep required varies much in different persons. Occasionally want of sleep is complained of when it is found that as much is obtained as the age and habits of the patient require.

Excessive sleep, although less distressing to the patient himself than defective sleep, is sometimes of equal or greater importance. Adults seldom require more than seven or eight hours' sleep, but many exceed this limit, and by excessive sleep diminish metabolic changes and the excretion of waste-products, thus encouraging a tendency to obesity, biliousness, and gouty disorders, and to early degenerative changes in the cardiovascular system. The habit of sleeping too much must, therefore, be combated. Excessive sleep is often met with in gouty and plethoric subjects¹ who eat and drink freely, and in whom a tendency to cerebral apoplexy is suspected. Somnolence may likewise sometimes be a premonitory symptom of apoplexy. Such persons will fall asleep when left alone, at any hour during the day, especially after meals, and sometimes, if allowed to, will sleep on for three or four hours at a time, in addition to getting nine or ten hours of heavy sleep at night. An abundance of open-air exercise, together with strict

¹ This tendency to excessive sleep and to uncontrollable attacks of sleep in gouty and plethoric persons is sometimes termed 'narcolepsy.' It is, of course, quite distinct from the attacks of excessive sleep known to have occurred in young persons and from sleep-like conditions associated

limitation of food and drink, is required, and a course of treatment at sulphated alkaline spas, such as MARIENBAD, CARLSBAD, TARASP, RICHFIELD, New York, HOT SPRINGS, Virginia, may be recommended, or, when the condition occurs in leaner individuals, at one of the muriated or muriated sulphur springs, such as KISSINGEN, HOMBURG, HARROGATE, LLANDRINDOD, CRAB ORCHARD, Kentucky, and SHARON, New York. After the course of waters the patient should be sent to an inland climatic resort of moderate elevation for some weeks, where exercise should be encouraged and much time spent in the open air. Massage and Swedish gymnastics may also be useful in some of these cases.

CHAPTER XVI

AFFECTIONS OF THE EYES, EARS, AND SKIN

Affections of the Eyes. Affections of the Ears. Affections of the Skin.

AFFECTIONS OF THE EYES

The constitutional conditions with which affections of the eyes are associated or on which they depend are sometimes more or less amenable to treatment by climates and health resorts. Thus, in affections of the conjunctiva and cornea occurring in scrofulous and weakly children, treatment of the scrofulous condition by climates, etc. (see page 323), may be employed, together with the special treatment of the ocular condition. In other affections of the eyes when there is **anemia**, **muriated**, **chalybeate**, and **arsenical spas** may be employed, and in **gouty** persons the sulphated and sulphated alkaline waters, when there are chronic constipation and a plethoric tendency. In regard to health resorts, positions amidst shady woods should be selected, such as the **FLIMSER-WALDHÄUSER** and **GURNIGEL**, sheltered from high winds and removed from the dust and glare of chalky and sandy roads and cliffs. Sea voyages and residence at the seaside are not generally to be recommended on account of the glare of the sea. At **SHARON SPRINGS**, in New York, there is an 'eye-water spring' containing magnesium bicarbonate, calcium sulphate, magnesium sulphate, and sodium and magnesium chlorids. Sulphur baths under proper supervision are also employed.

AFFECTIONS OF THE EARS

In children and young persons, **chronic and purulent discharges from the middle ear** are usually protracted by adenoid vegetations of the nasopharynx or by a scrofulous tendency or general weakness. In addition to local treatment, including removal of adenoids, the advice given under the heading 'Scrofula' may be recommended

according to individual indications. In **chronic dry catarrh of the middle ear** leading to sclerosis and associated with a gouty tendency the indications given under the heading of 'Gout and Gouty Conditions' may be referred to. When the catarrh occurs in plethoric persons who eat and drink too freely, a course at sulphate alkaline spas may be of use, but the diet and regimen will need to be permanently altered. When habitual constipation and dyspepsia are associated with similar aural conditions, treatment of the constipation and dyspepsia by spas and mineral waters may be serviceable. **Menière's symptoms and disorders of the internal ear** are not infrequently more or less connected with a gouty tendency and chronic dyspepsia, in the treatment of which conditions climate and health resorts may, as already mentioned, play a part. In affections associated with chronic malaria and syphilis, health resorts may sometimes take a small share in the treatment. (See headings 'Chronic Malarial Affections' and 'Syphilis.') Occasionally various disturbances, such as vertigo, with or without a kind of agoraphobia, and 'functional deafness' may be associated with **hysteria** or **neurasthenia**, and under these headings the possibility of climates and health resorts has been discussed. There are various subjective noises and a kind of partial deafness or 'dullness of hearing' or altered perception of sound that may occur as symptoms of **anemia** or conditions of general debility, such as during convalescence from acute diseases, and pass off when the anemia is treated and the general health improved. (See indications under headings 'Convalescence' and 'Anemia and General Debility.') In some persons almost every attack of severe coryza and catarrh of the upper respiratory passages is associated with temporary aural disturbance and deafness, and there is a danger of the development of permanent middle-ear disorder if the tendency to repeated catarrhal attacks be not checked by appropriate climatic and general hygienic measures. In **chronic catarrhal conditions of the middle ear** treatment of the nasal and pharyngeal mucous membranes by douches, sprays, and inhalations, such as are employed at many health resorts, may be useful. (See heading 'Chronic Catarrh of the Larynx, Pharynx, and Nose.') Occasionally, the question arises of the advisability of sea-bathing for persons with ear disorders

The repeated impact of the water has a tendency to increase, or even to produce, aural disturbances, and patients suffering from chronic affections of the ear or who have a tendency to aural catarrh should, as a rule, be advised not to bathe in the open sea. Exceptions in individual cases may be made with due discretion.

Deafness and other aural disorders due to the **degenerative changes** occurring in the ear and nervous structures as the result of senility or premature senility, may to some extent be warded off or delayed by the measures referred to under the heading 'Old Age and Premature Old Age,' especially by the mental influence of travel, visits to historic towns with art treasures and other attractions, and agreeable social intercourse at health resorts. By these means and by the others already mentioned, the functions and structures of the whole body, including those of the aural apparatus, are moderately exercised and prevented from falling by disuse into premature decay.

AFFECTIONS OF THE SKIN

Climate does not play a prominent part in the treatment of skin diseases, while mineral waters and baths are fully considered in another volume. In all cases, however, attention must be paid to any state of the body predisposing to the cutaneous affection. In **syphilitic skin disease** the climatic and balneotherapeutic treatment, already indicated for syphilis, in addition to the ordinary methods, act beneficially. When associated with **anemia**, skin diseases may be benefited by treatment at chalybeate and arsenical spas. When **eczema**, **psoriasis**, and **pruritus** occur in **gouty** persons, climatic and balneotherapeutic treatment for the gout (see p. 283) may have a beneficial result on the cutaneous affection. In **lupus vulgaris** and **tuberculous affections of the skin** suitable climates may indirectly exercise a good effect by promoting the powers of resistance (see under 'Scrofula'), but they will not take the place of ordinary treatment. A visit to high northern latitudes or other regions where the full force of the sun is available for **phototherapeutic** measures may be useful. When the nervous system is at fault, climates and spas are not rarely useful, partly owing to the change of surroundings and relief from mental worry that they afford. Thus,

in **acne** and **acne rosacea** relief from mental worries and the improvement of digestion that are incident to the sojourn at a health resort may greatly diminish the **acne**. In many cases of **eczema**, likewise, the beneficial effects of change of climate may be explained in the same way. In all such cases climates and health resorts must be chosen according to individual indications. In overworked persons of fairly strong constitution dry inland climates of moderate or high elevation are frequently suitable, while in nervous and excitable persons of weak constitution health resorts amidst shady woods, in beautiful mountain valleys of low or moderate elevation, are preferable during summer, and one of the warm seaside winter resorts may be selected during winter.

In the selection of climates for persons peculiarly susceptible to cutaneous affections, the effects of heat, bright sunshine, glare, strong winds, and cold weather must in each case be considered carefully. Thus, **lupus erythematosus** is generally aggravated by cold winds and the glare of a hot sun. Some cases of **eczema** are enhanced by cold, especially cold winds, and others by heat and sunlight. The curious cases of summer and winter eruptions due to special idiosyncrasies of the skin, and the rare and grave disease termed '**xeroderma pigmentosum**' (**Kaposi's disease**), which is greatly aggravated by strong light, merely require mention.

Mineral water health resorts are of special utility when there is some obvious gouty or other defect in the metabolism or in the general state of health. In gouty cases the eliminative effect of internal courses of alkaline, muriated, sulphurous, or muriated sulphurous waters is often made use of, and in **eczema** connected with glycosuria the measures recommended under the heading '**Diabetes**' may be serviceable. The simple thermal baths of **SCHLANGENBAD** and similar resorts may owe some of their beneficial action on the skin to the improvement that they doubtless cause in the circulation through the small cutaneous blood-vessels; their action in atrophic and senile conditions of the skin is, therefore, readily explained. In chronic cases of **eczema** and **psoriasis** the prolonged tepid baths of **LOÈCHE-LES-BAINS**, in Switzerland, act probably by macerating the thickened epidermis, washing off

scales and discharges, and in some way favorably influencing the nerve-endings in the skin. Bathing during from four to six hours every day at Loèche-les-Bains generally leads, at about the tenth or eleventh day, to a peculiar cutaneous reaction, at times an actual dermatitis, called the *poussée*, which precedes the disappearance of the eruption. Unfortunately, even when the result is most striking, it is often not permanent. The local effect on the skin of a course of any prolonged baths or salt-water baths is the reverse of sedative, and such treatment can be recommended only in the very chronic, nonprogressive cases of eczema and psoriasis that show very little irritability and in which other stimulating local applications, such as various ointments, and the like, are not counterindicated. In eczema, the spas of SCHINZNACH, URIAGE, and SAINT-SAUVEUR have acquired a certain reputation, and for individuals belonging to gouty families ROYAT and LA BOURBOULE, in the Auvergne Mountains, may be employed. Mere change of climate, however, often gives relief in eczema, but places that are cold and damp, or windy, must be avoided, and sea air often aggravates the eruption—at least, in the first instance.

Among the American waters suitable for external application in affections of the skin are those of the HOT SPRINGS of Arkansas, the HEALING SPRING of Virginia, and the neighboring WARM SPRINGS. The GREENBRIER WHITE SULPHUR SPRINGS in West Virginia have a decided but gradual effect on disturbances of the skin. For internal use the two waters last mentioned may be employed. SARATOGA VICHY water and the saline sulphureted waters, such as those of RICHFIELD and SHARON, New York, and the INDIAN SPRINGS, in Martin County, Indiana, are useful. Suitable springs in California are the INDIAN MUD SPRINGS, one of the geysers in Sonoma County, and the BYRON SPRINGS—White Sulphur and Black Sulphur—in Contra Costa County. The NAPA SODA SPRINGS, in Napa County, are an alkaline chalybeate group and popular in California for their antacid and tonic properties.

Some cases of troublesome *pruritus* are connected with an atrophic condition of the skin and cutaneous blood-vessels allied to senility or premature senility. In such cases the climatic indica-

tions are similar to those already alluded to under the heading 'Old Age and Premature Old Age.' Warm, dry health resorts are preferable during winter, and if possible, much time should be spent in the open air. During summer a course of baths at a pleasant simple thermal spa of medium elevation, such as WILDBAD, SCHLANGENBAD, RAGATZ, BADEN, in Switzerland, and BUXTON, will improve the circulation in the cutaneous blood-vessels and induce better nutrition and less irritation in the disordered nerve-endings of the skin. In other cases of pruritus defective function of the liver and kidneys and derangement of the general metabolism will often explain the irritation. In strong and plethoric persons in whom the hepatic functions are supposed to be at fault CARLSBAD and the sulphated alkaline spas may be of use. In other cases simple alkaline, muriated, and simple thermal spas may be given the preference. In some neurasthenic and fatigued individuals with pruritus a mere holiday with rest and change of climate and surroundings may exercise a tonic effect and relieve the itching.

In all cases of pruritus the possibility of **glycosuria**, if not of actual **diabetes mellitus**, must be borne in mind, and if this condition be found, the treatment must be regulated accordingly.

In obstinate eruptions of **boils** (chronic furunculosis) a change of climate to the seaside or to the mountains may be recommended, or a course at sulphurous, chalybeate, or arsenical spas; in cases associated with glycosuria and mental worry, sea voyages may have an excellent effect. In chronic **urticaria** a change of climate may likewise be beneficial.

A condition of **weakness of the skin** exists that, although it may hardly be termed a skin disease, demands our attention. Those in whom this condition is present, manifest a tendency to profuse perspiration, and on the least exposure to cold 'catch a chill,' and suffer from muscular rheumatism, neuralgia, diarrhea, or catarrh of the nasal or bronchial mucous membranes. Sometimes the condition accompanies convalescence from acute disorders, and the remarks that we have made under that heading apply here. Occasionally

the cutaneous condition is merely a part of a generally weak constitution. In some patients undoubtedly it is part of a general lack of vasomotor tone. In the case of weak patients and of those deficient in vasomotor control, high altitudes and cold localities must generally be avoided, but prolonged residence at some dry inland health resort of moderate elevation, if much time can be spent in the open air, may be useful during the summer. A certain amount of 'hardening' can be accomplished in many cases by appropriate hydrotherapeutic measures and by judicious open-air exercise. A long sea voyage in warmer climates during winter may be recommended when the patient is a 'good sailor.'



INDEX

A

Abbazia, 252, 268, 277
Abortion and sterility, habit, balneotherapeutic treatment, 363; habit, Nauheim treatment, 363
Absecon, 103, 104
Acclimatization in Bolivia, 55; in Peru, 56
Achensee, 329
Acid Spring, 198
Acireale, 277
Acne, 384; rosacea, 384
Acto, 119
Addison Sulphur Springs, 134
Adenoid vegetations of nasopharynx, 381; vegetations, seaside for, 327
Adirondack Cottage Sanatorium, 111, 258, 321
Adirondacks, 78, 79, 98, 109, 110, 112, 308, 316, 332, 333, 367; of Canada, 82
Acrotherapeutics, artificial, 314, 332
Affections, atonic, mucous membranes, Rock-bridge Alum Springs, 131; gouty, milk in, 250; of eyes, ears, and skin, 381; of the skin, tuberculous, 383 (see also *Skin, Affections*); renal, milk in, 251
Africa, South, 23
Age, old, 300; old, climatic treatment, 300, 301; old, sea voyages, 301; old, spas, simple thermal, 301; old, towns, interesting, residence in, 301. Old, premature, 302. See *Periods of Life, Various*; also *Senility*.
Aged persons, Block Island, 93; Cape May, 107; Nantucket, 93; Richmond, 120; summer residence, 301, 302; Vineyard Haven, 93; winter residence, 301, 302; Atlantic City, 106
Ager, 198
Agoraphobia, 382
Agua Caliente, 182
Ague, brow, 371. See *Malarial Affections, Chronic*.
Aiken, 78, 137, 138, 140, 142, 278, 294, 310, 315
Air, chilly damp, Castine, 88; chilly damp, Mount Desert Island, 87. Clear, cool, bracing, Boulder, 176. Cold, damp, north-western coast of California, 189. Cool stimulating, Thousand Islands, 109. Dry, Buena Vista, 125; Colorado Springs, 177; Denver, 175; Hot Springs (N. C.), 137; Las Cruces, 171; Ojai Valley, 195; Santa Fe, 169; Tarkastad, 27; balmy bracing, Camden, 138; bracing, Check's Springs, 139; mild, Thomsville, 140; pure, Belize, 64; Catskills, 114; El Paso, 151; Glen Summit, 123; Idyllwild, 104; Mena House, 19; Middle Park, 179; North Park, 179; park region of Minnesota, 165; Pocono Mountains, 123; San Luis Park, 179; sheltered valley of Colorado, 179; South Park, 179; pure bracing, Huancayo, 55; Jauba, 55; Morgantown, 137; pure cool, Eaglesmere, 124; pure desert, steppes of Tartary, 37; pure exhilarating, Lake Min-

netonka, 165; rare, Albuquerque, 169; temperate, Aiken, 138; tonic, Boerne, 150; tonic invigorating, North Dakota, 166; winter, Canada, 81; Prescott, 183. Dryness, Andes, 51; Arizona, 180; Colorado, 172; Egypt, 21; pathologic effects, 80; South Africa, 23. Influence of, on digestive disorders, 248. Moist, southern California, 190; warm, Tarpon Springs, 147. See *Climates*.
Aix-la-Chapelle, 280, 368, 370
Aix-les-Bains, 280, 370
Ajaccio, 327
Akesion Springs, 153
Alabama, 152
Alameda (N. M.), 171
Alameda (Cal.), 196
Alamogordo, 171
Alaska, 189, 367
Albany, 117
Albemarle Sound, 135
Alberta, 85
Albuminuria, 343; chronic, with anemia, chalybeate waters, 345; Egyptian climate, 21; in Arizona, 180; in Colorado, 172; lesser and temporary forms, 354. See *Bright's Disease; Kidneys; Nephritis; and Urinary Organs, Diseases*.
Albuquerque, 169
Alcohol, effects of, Atlantic City, 106
Alcoholism, headaches due to, climatic treatment, 376
Alexandersbad, 329
Alexandria Bay, 109
Alexandria (Minn.), 165
Algiers, 277, 315, 327, 353
Algonac, 161
Alimentary tract, chronic disorders, waters, Addison Sulphur Springs, 134. See *Calarrh, Gastric, etc.*, also *Digestive Apparatus*.
Aliwal North, 27
Alkaline waters. See *Waters*.
Alleghath River, 96
Alleghany Mountains, 79, 122, 125, 127, 129, 308
Alleghany Springs, 132, 348
Allouez Mineral Springs, 163
Alma Sanatorium, 161
Alpine resorts, 310, 315, 319, 367
Alps, climate, difference of, from Andes, 51
Altadena, 193
Alt-Aussee, 329
Altitude, high, effects, 172, 195; for phthisis, 310, 315, 319. High, resorts, Andes, 51; Arizona, 181; Australia, 40; British Columbia, 84; California, 193, 194; Cloudland, 152; Colorado, 172; Dakota, 166; Himalayas, 32, 37; India, 32, 35, 36; Mexico, 219, 220; Montana, 185; Mountain Lake, 132; Nevada, 187; New Mexico, 169; North America, 78, 79; Peru, 51, 55; South Africa, 23; South America, 50; Utah, 185; Yellowstone Park,

- 184; sanatoriums in Switzerland, 257.
 Moderate, in India, 34; North America, 78, 79; Mexico, 219, 221; South Africa, 23.
 Variety, Santa Catalina Island, 191. See *Health Resorts, High Altitude, etc.*
 Alum Spring, 198. See also *Waters*.
 Alvarado, 222
 Amalfi, 23, 366
 Amazon River, 57
 Ambrosia artemisiifolia, 332
 Amelie-les-Bains, 312
 Amenorrhea, 361; moor baths, Franzenbad, 361; waters, Yellow Sulphur Springs, 132
 American Carlsbad Springs, 160
 Amherst, 216
 Amherst College, 216
 Ammonoosuc Valley, 96
 Anahuac, plateau of, 219
 Ancohuna, 54
 Anderson, 198
 Andes, 50, 52, 54, 310, 315, 319; climatic difference of, from Alps and Rockies, 51
 Anemia and general debility, 270; conditions associated with, 274; dilatation of the heart and, Nauheim, 277; dilatation of the heart and, Oeyenhausen, 277; due to acute and chronic diseases (see *Convalescence*); due to chronic purulent and mucopurulent discharges, chalybeate waters, 273; due to direct loss of blood, chalybeate waters, 273; due to neuralgia, mental worry, and overwork (see *Neurasthenia*); due to sluggish portal circulation and constipation, climatic treatment, 274; menstrual disorders due to, Fauquier White Sulphur Springs, 130. **Resorts**, summer, high altitude, 276; summer, seaside, 276; summer, slight or medium elevation, 276; winter, high altitude, 277; winter, seaside, 277. **Waters**, Buxton, 278; Clayford Chalybeate Springs, 132; Gastein, 278; Harbin Hot Sulphur Springs, 197; Mardela Springs, 127; Napa Soda Springs, 197; Nye Lithia Springs, 132; Ragotz, 278; Rawley Springs, 130; Schlangenbad, 278; Sweet Chalybeate Springs, 131; Teplitz, 277; Wildbad, 278. See also *Chlorosis*.
 Anemic fever. See *Fever, Anemic*.
 Angina pectoris, climatic treatment, 338
 Anglesen, 103
 Ann Arbor, 218
 Annapolis, 217
 Anorexia, kumiss for, 37
 Antelope Park, 179
 Antidyspeptic and tonic springs, Burkeville, 129
 Antigua, 73
 Antigua Guatemala, 65
 Antilles, Greater, 66
 Antilles, Lesser, 72
 Apartment houses, New York city, 204
 Apollinaris, 356
 Apostle Islands, 162
 Appalachian Mountains, 128, 298, 369
 Appel, Major D. M., 322
 Appendicitis, baths in convalescence from, 269. See also *Convalescence*.
 Appetite, loss of, Atlantic City, 106
 Archachon, 277, 309, 315, 324
 Arcadia (Mich.), 161
 Arco, 252, 277, 308
 Arequipa, 50
 Aretæus, 303
 Argentine Republic, 53
 Arizona, 78, 167, 179, 193, 315, 353; chronic rhinitis prevalent, 180; climate discourages exercise, 180; climatic features, 180; clothing, kind necessary, 180; influences, moral, 182; pharyngitis and tonsillitis, prevalent, 180
 Arkansas, 78, 154
 A. S. Institute of Technology, 215
 Arosa, 257, 334
 Arteries, coronary, diseased, climatic treatment, 338. See *Age; Old, etc.*
 Arthritis, chronic progressive, 290; chronic rheumatoid, 288; climatic treatment, 289; baths, thermal, 289; baths, electric light, 289; baths, mud and peat, 289; sea voyages, Mediterranean, 289; sea voyages, West Indies, 289. See *Rheumatoid Arthritis, Ossificans*, chronic or progressive, hot baths or douche-massage, Aix-les-Bains, 290; Baden-Baden, 290; Bath, 290; Hot Springs (Ark. and Va.), 290; Klamath Hot Springs, 290; Las Vegas, 290; Wiesbaden, 290
 Articular affections, waters, Klamath Hot Springs, 198. See *Joints; Gouty Conditions; Rheumatism, etc.*
 Artificial aërotherapeutics, 314, 332
 Arundel Lithia Springs (Miss.), 149
 Asbury Park, 103, 104
 Asheville, 78, 79, 135, 310, 316
 Ashland, 162
 Asia, 31
 Asquam Lake, 97
 Assiniboia, 80
 Assistance Publique de Paris, Berck-sur-Mer, 259
 Assouan, 17, 18, 20, 277, 353
 Asthma, cardiovascular, 334; in the aged, 334; neurotic, 334; secondary to chronic bronchitis, 335; spasmodic, 334. **Treatment**, climatic, hot, United States of Columbia, 61; climatic, 334; climatic, Camden, 138; climatic, Hawaii, 240; climatic, Ojai Valley, 195; climatic, Phoenix, 182; mineral water health resorts, 334. Sanatorium, Gravenhurst, 82; waters, Greenbrier White Sulphur Springs, 134. See also *Respiratory Organs, Diseases*.
 Ataxia. See *Nervous System, Disorders*; also *Tabs Dorsalis*.
 Athabasca, 80
 Athens, 367
 Athens (Ga.), 218
 Atheroma, chronic, climatic, treatment, 338
 Atlanta, 139, 143
 Atlantic City, 93, 103, 104, 105, 209, 259, 270, 294, 308, 316, 340, 353; South, 103
 Atlantic Highlands, 103
 Attfield, 19
 Attica, 159
 Auckland, 44
 Auckland Islands, 47
 Augusta, 140, 143, 277
 Aurora, 199
 Aurora Saline Springs, 199
 Aurora Springs, 153
 Ausable Lakes, 113
 Austin, 150
 Australasia, 38
 Australia, 38; coast region, variable climate, 40; coast towns, unsuitable for consumptives, 38; inland plains, disadvantages, 41; inland plains, value of, to invalids, 40; mountains, 40; towns of, 42
 Australia, South, 39
 Australian Alps of Victoria, value of, to invalids, 40
 Autumn. **Resorts**. See *Resorts*.
 Avalanche Pass, 113
 Avalon (Cal.), 191
 Avalon (N. J.), 103, 104
 Avon (N. J.), 103
 Ax-les-Therres, 280
 Azores, 101, 366
 Azusa, 193

B

- Babylon (L. I.), 102
 Backache, mineral water health resorts, 371

- Baden, 370
 Baden-Baden, 246, 255, 290, 370
 Badenweiler, 329
 Bagnères-de-Luchon, 280
 Bahama Islands, 71, 77
 Ballston Spa, 347
 Baltimore, 108, 125, 126, 127, 207, 208
 Baltimore, schools of, 215
 Banff, 79, 84, 334
 Bar Harbor, 87, 95, 104
 Barbados, 72
 Barium Springs, 137
 Barkley West Home, 28
 Barnegat, 104
 Barnegat Beach, 103
 Barnegat Park, 103
 Barnegat Pier, 103, 104
 Barron, John, 256
 Barrie, 80
 Bartow, 309
 Basedow's disease, 371. See *Graves's Disease*.
 Baase Terre, 77
 Bathing pool, Castle Creek Hot Springs, 183
 Bath, 370
 Bath Alum Springs, 131, 347
 Baths, Alma Sanatorium, 161; Beck's Hot Sulphur Springs, 186; Castilla Hot Springs, 186; for chronic types of skin disease, waters, Crockett Arsenic Lithia Spring, 132. Brine, 269, 287; Glenwood, 178; Nantucket, 94; Salt Lake Hot Springs, 186. Cold, St. Augustine, 146. Electric, Bath Spring (Ind.), 159; St. Augustine, 146. Electric-light, for chronic rheumatoid arthritis, 289. Hot, Caledon, 26; Hot Mud Springs, 198; Hot Springs of U. S., for chronic and subacute rheumatism, 287; St. Augustine, 146; and cold sulphur, Carnelian Hot Springs, 198. Hot-air, for chronic rheumatoid arthritis, 289; Richfield Springs, 117. Hot peat, for chronic rheumatoid arthritis, 289. Hot sulphur, Greenbrier White Sulphur Springs, 134. Hot vapor, for chronic rheumatoid arthritis, 289. Hot waters, Helena, 185. Lithia water, Mudlavia, 159. Mineral, warm seasons, 253. Mud, Las Vegas Hot Springs, 169; Mudlavia, Ind., 159; and peat, in delayed convalescence, 269. Natural hot vapor, Glenwood, 176. Nauheim, Greenbrier White Sulphur Springs, 134; St. Augustine, 146. Plunge, Hot Springs (S. Dak.), 166. Roman, Greenbrier White Sulphur Springs, 134. Russian, Bath Spring, 159; Deer Park, 127; Greenbrier White Sulphur Springs, 134; Richfield Springs, 117. Shampoo, Bath Spring, 159. Simple thermal, in convalescence from appendicitis, Plombières, 269. Spout, Greenbrier White Sulphur Springs, 134. Sulphur, Bath Spring, 159; Richfield Springs, 117; Salt Lake Hot Springs, 186. Sun, Richfield Springs, 117. Thermal, Capon Springs, 134; for chronic rheumatoid arthritis, 289; Highland Springs, 198; effervescent, Nauheim, 287; seawater, Santa Monica, 193; sulphurous, Topo Chico, 221. Tub, gout, waters, Richfield Springs, 117; and vapor, Glenwood, 178. Turkish, Bath Spring, 159; Deer Park, 127; Greenbrier White Sulphur Springs, 134; Richfield Springs, 117. Waters, Sheboygan Mineral Well, 163. See also *Health Resorts*, *Seaside*, *Waters*, and *Treatment* under the various diseases.
 Battle Creek, 161
 Baumann, E., 373
 Bay Head, 103, 104
 Bay of Passamaquoddy, 86
 Bay Port, 161
 Bay St. Louis, 148
 Bay View, 161
 Bayfield, 162
 Beach Haven, 103, 104, 105, 333
 Bear Valley, 187
 Beaufort West, 26
 Beaulieu, 305
 Beck's Hot Sulphur Springs, 186
 Beddoes, 256
 Bedford (Va.) Alum, Iron, and Lithia Springs, 131
 Bedford Springs (Pa.), 125, 345, 369
 Bedford (Pa.) Sulphur Spring, 349
 Beecher, Henry Ward, 95
 Belfast (Me.), 88
 Belize, 64, 65
 Belmar, 103
 Bentley's Springs, 127
 Benton Harbor, 161
 Bergen, Norway, 164
 Beri-beri, death from, in Philippines, 49
 Berkeley (Cal.), 196, 218
 Berkeley (N. J.), 103
 Berkeley Springs (W. Va.), 134
 Berkshire County (Mass.), 99
 Berkshire district (Mass.), 78
 Berkshire Hills (Mass.), 79, 99
 Berlin, 301
 Bermuda Islands, 74, 78, 270, 325, 367
 Bethel (Me.), 97
 Bethlehem (N. H.), 96, 97, 301
 Bex, 252
 Biarritz, 268, 277, 324
 Big Indian, 115
 Bijou, 187
 Bile-duct, affections, 348; chronic obstruction, 352
 Bile-ducts, liver and, affections, 348. See *Digestive Apparatus, Diseases*; also *Liver, Affections*.
 Bile-passages, catarrh, mineral waters, 351. See *Gallbladder*.
 Biliary colic, mineral waters, 352; concretions, treatment, 350. See *Cholelithiasis*; also *Gallstones*.
 Biliousness, 349. See *Liver, Affections of, and Bile-ducts*.
 Biloxi, 149
 Bishop, Sereno, 226
 Bitter Root Valley, 185
 Black Barren Mineral Spring, 126
 Black Forest, 257
 Black Hills (S. D.), 166
 Black Mountains (N. C.), 136
 Bladder troubles, waters, Highland Springs, 198. See *Urinary Organs, Diseases*.
 Block Island, 92, 93, 101, 135, 211
 Bloemfontein, 28
 Bloomington, 218
 Blowing Rock, 137
 Blue Lick Mineral Springs (Ky.), 155, 274
 Blue Lick Springs (Mo.), 153
 Blue Mountain Lake, 111
 Blue Mountains (Jamaica), 66
 Blue Mountains of New South Wales, value of, to invalids, 40
 Blue Ridge Mountains (Pa.), 121, 122, 125, 308, 316
 Blue Ridge Mountains (N. C.), 136, 308
 Blue Ridge Mountains (Va.), 128, 129, 130
 Blue Ridge Springs, 131
 Blue Sulphur Springs, 134
 Bodington, George, 257
 Boerne, 150
 Bogota, 59, 60; monotony, ill effects of, 60; nervous diseases prevalent, 60; tetanus prevalent, 60
 Boils, 386; associated with glycosuria and mental worry, 386; climatic and spa treatment, 386
 Boise City, 179
 Bolivia, 54
 Bolton, 111

Bolton Station, 185
 Bombay Presidency, 34
 Bones and joints, tuberculosis, open-air treatment, 325 (see *Tuberculosis*); chronic tuberculous disease, Cape May, 107
 Booroolong, 41
 Bootie Paramo, 54
 Boquet River, 113
 Borland Mineral Well, 134
 Boston, 91, 175, 203, 214, 259; east winds of, 203; schools near, 216; schools of, 215; University, 215; vicinity of, 204
 Botzen, 252, 277
 Boulder, 176, 218
 Bourbon-l'Archambault, 364
 Bourbonne, 370
 Bournemouth, 258, 308, 309, 324, 353
 Bow River, 84
 Bowden Lithia Springs, 139
 Bowditch, Dr. Henry I., 91
 Bowdoin College, 216
 Bozeman, 185
 Brachialgia, 369. See *Nervous System, Diseases*; also *Sciatica*, etc.
 Bradshaw Mountains, 183
 Braemer, 208
 Brain lag, Lake Superior, 162. See also *Nervous System, Diseases*; *Neurasthenia*; *Rest and Recreation*.
 Brazil, 57
 Brehmer, Dr. Herman, 257
 Brefia, Dr., 220
 Brentwood, 102
 Brides-les-Bains, 296, 297
 Bridgetown, 73
 Brielle, 103
 Brigrantine, 103
 Brighton Beach (L. I.), 102
 Bright's Disease, chronic, Atlantic City, 106; chronic, pine belt of North Carolina, 135; waters, Bedford Springs, 125; waters, Topo Chico, 221. See *Kidney*; *Nephritis*; and *Urinary Organs, Diseases*.
 Brine baths (see *Baths*); spas for convalescence from acute rheumatism, 287
 British Columbia, 80, 81, 84, 189
 British West Indian Islands, 72
 Broadbent, Dr. J. F. H., 338
 Bronchial affections, Carmelian Hot Springs, 109; affections, Hot Springs (S. Dak.), 166; affections, Summerville, 141; Florida, 144; Lake Pontchartrain, 148; Santa Barbara, 193; White Mountains and adjacent regions, 97. Affections, chronic, Red Sulphur Springs, 133. Irritation, Maritzburg, 30; irritation, Pietermaritzburg, 30. See *Bronchitis*; also *Catarrhal Affections*; and *Respiratory Organs, Diseases*.
 Bronchiectasis, climatic treatment, 331; Egypt, 21, 22
 Bronchitis and asthma, Hawaii, 240; climatic treatment, 329; Avalon, Santa Catalina Island, 192; Bermuda, 76; Cumberland Island, 143; Egypt, 21; hot climates U. S. Colombia, 61; Phoenix, 182; pine belt of North Carolina, 135; Richfield Springs, 117; Virginia Beach, 108. Chronic, and pulmonary emphysema, climatic treatment, 328; Egypt, 22; Ojai Valley, 195; whey, warm, 250. Convalescence from, Tarpon Springs, 147. Waters, Greenbrier White Sulphur Springs, 134. See also *Respiratory Organs, Affections*.
 Brooklyn, 100, 204
 Brooklyn Home for Consumptives, 321
 Brougham, Lord, 301
 Brow ague, 371
 Brown University, 217
 Brown's Mills, 119
 Bruce, Mitchell, 251

Brückenau, 329
 Brunner, Dr., 69
 Brunswick (Ga.), 143, 347
 Brunswick (Me.), 216
 Brunton, Lauder, 351
 Bryn Mawr College, 216
 Buckhorn Cañon, 183
 Buckingham White Sulphur Springs, 132
 Budd's Lake, 122
 Buena Vista (Mexico), 221
 Buena Vista (Pa.), 125
 Buenos Ayres, 53, 54
 Buffalo (N. Y.), 124
 Buffalo (Va.) Lithia Springs, 129, 35
 Burghersdorp, 27
 Burke's Garden, 132
 Burkeville, 129
 Burlington, 98
 Burner's Springs, 130
 Bushkill, 123
 Buxton, 278, 296, 298, 385
 Buzzard's Bay, 91
 Byron Springs, 348, 385

C

Cachectic conditions, kumiss, 37
 Cachexia, malarial, 297; waters, 297; waters, Harbin Hot Sulphur Springs, 197; waters, Napa Soda Springs, 197. Syphilitic, 282; anti-syphilitic treatment, potassium iodid and mercury, 282; climatic resorts, summer, 282; climatic resorts, winter, Riviera and Egypt, 282; general hygienic management, 282; general nutrition, disturbance, 282; hematopoietic functions, 282; hydrotherapeutic treatment, 282; rest and open-air treatment, 282; waters, iron and arsenic, 282
 Cairo (Egypt), 17
 Cairo (N. Y.), 115
 Calabesas, 181
 Calcium oxalate, 355
 Calculi, hepatic, 350; in kidneys and bladder, 358; renal, waters, Farmville Lithia Springs, 129; vesical, waters, Farmville Lithia Springs, 129. See also *Urinary Organs, Diseases*; *Gall-stones*; and *Gouty Conditions*.
 Caldwell, 111
 Caledon, 26
 Calgary, 79, 85
 California, 188, 277, 285, 290, 294, 301, 302, 308, 316, 331, 345, 347, 353, 367, 370, 371, 374, 378; chief town of, 214; climatic features, 189; coast belt, 190; coast line, 189; mineral springs, 197; northern, 195; southern, coast resorts, 190; tuberculous patients, prejudice against, 104; winds, cold ocean, 190
 California Seltzer Springs, 347
 Calistoga, 198
 Calistoga Hot Springs, 351
 Cambridge (Mass.), 216
 Cambridge Springs (Pa.), 124, 345
 Camden (Me.), 88, 89
 Camden (N. J.), 104
 Camden (S. C.), 138, 301, 309
 Campbell Hot Springs, 187
 Campinas, 59
 Campobello, 77, 86, 333
 Canaan (Conn.), 99
 Canada, 80, 97, 109, 367; Adirondacks of, 82
 Canadara Lake, 117
 Canadian National Park, 84; Rockies, 85
 Canandaigua Lake, 118
 Canary Islands, 309, 327, 367
 Cannes, 301
 Canney, Dr., 17, 20, 22
 Cañon City, 177
 Canonicut Island, 94

- Canterbury Plains, 44
 Cape Arundel, 89
 Cape Breton, 77, 82, 84
 Cape Cod, 77, 91, 301
 Cape Hatteras, 74, 135, 211
 Cape Horn, 52
 Cape Lookout, 135
 Cape May, 93, 103, 104, 105, 106, 120, 209, 324
 Cape May Point, 103, 106
 Cape of Gracias a Dios, 64
 Cape Race, 83
 Cape Town, 24
 Cape Vincent Lake, 109
 Capon Springs, 134, 270
 Cardiac affections, Cloudland, unsuitable, 152; affections, mechanotherapy, 247; affections, San Gabriel Valley, 193; affections, Terrain-Cur, 246, 339. *Weakness*, after influenza and other infectious diseases, 327; climatotherapeutics, 246; regulation of open-air exercise, 246, 247. See also *Heart*; and *Circulatory System, Diseases*.
 Carlisle (Ky.), 155
 Carlisle (Pa.), 217
 Carlisle Springs, 126
 Carlsbad, 247, 283, 295, 296, 347, 385
 Carnelian Bay, 108
 Carnelian Hot Springs, 198
 Carpenter, Mr. Ford A., 190
 Carrion, Dr. D. A., 56
 Cartagena, 59
 Cartago, 63
 Casa Grande, 179
 Cascade Mountains, 199, 200, 201
 Cashmere, 37
 Cass Lake, 164
 Cassiodorus, 303
 Castellammare-di-Stabia, 277, 303, 366
 Castilla Hot Springs, 186
 Castine, 88
 Castle Creek Hot Springs, Arizona, 182, 371
 Castorius, 209
 Catamarca, 54
 Catarrh, chronic bronchial, waters, Utah Hot Sulphur Springs, 186; chronic, hot climates, U. S. Colombia, 61; chronic nasal, waters, Greenbrier White Sulphur Springs, 134; chronic, of the air-passages, prevalent, St. Vincent, 164; chronic, of pharynx, larynx, and nose, 327; climatic treatment, Camden (S. C.), 138; gastric, waters, Capon Springs, 134; gastric, chronic, waters, Wilhoit Springs, 199; gastro-intestinal, waters, Glenwood, 178; hepatic, waters, Glenwood, 178; of the alimentary tract, waters, Gettysburg, 126; repeated attacks of, Egypt, 22; vesical, waters, Capon Springs, 134; waters, Richfield Springs, 117
 Catarrhal affections, influence of weather on, 190; affections, Mount Desert Island, unsuitable, 87; affections, of the mucous membrane, waters, Rockbridge Alum Springs, 131; affections, of the respiratory passages, Morristown, 121; affections, of the respiratory organs with irritable cough, winter residence in West Indies, 65; affections, summer climate, Morganton, 137; inflammations of the air-passages, Hammononton, 120; inflammations of the air-passages, Vineland, 120. See also *Respiratory Organs, Diseases*.
 Catoosa Springs, 141
 Catskill Landing, 115
 Catskill Mountains, 79, 109, 114
 Catskill Mountain House, 115
 Cauterets, 312, 328, 330
 Caux, 298
 Cayuga Lake, 118, 217
 Cedar Bluff Sulphur Springs, 132
 Cedar Lake, 122
 Celsus, 303
 Central America, diseases endemic in, 62, 63
 Central High School, Philadelphia, 215
 Ceres, 26
 Ceresole Reale, 298
 Certain diatheses and toxemias, health resorts in, 279. See also *Children, Rachitic and Weakly*; *Gout*; *Poisoning, Chronic Metallic*; *Syphilis*, etc.
 Chaco, 54
 Chadwick on Squan Beach, 103, 104
 Chamberlain Hotel, Old Point Comfort, 108
 Champlain, Lake, 98, 113
 Change of life, 299. See *Climacteric*; *Menopause*; and *Periods of Life*.
 Channel Islands, 200
 Channel Islands of California, 77
 Charleston, 74, 137, 138, 142, 367
 Charlevoix, 161
 Charlotte, 137
 Charlottetown, 84
 Chateau d'Oex, 359
 Chateaugay, 111
 Chatham, 91
 Chattanooga, 141, 152, 153
 Chattolbanee Springs, 127
 Chautauqua Lake, 116, 140
 Chazy, 111
 Check's Springs, 139
 Chelan, 201
 Chelan Lake, 200
 Chelsea (N. J.), 103, 105
 Cherryfield, 86
 Chesapeake Bay, 108
 Chest diseases, grape cure, 252. See also *Respiratory Organs, Diseases*.
 Cheyenne City, 168
 Chicago, 160, 207, 208, 211, 259; schools of, 215; winds of, 211
 Chickamauga, 153
 Chickamauga National Park, 153
 Children, cretinoid and backward, waters, Rothbrunnen, 373. *Rachitic and weakly*, baths, brine and tepid, 279; climates, dry sunny inland, 279; rearing of, 279; seaside localities, warm sheltered, 279; waters, alkaline earthy chalybeate, 279. *Sanatorium for*, Red Bank, 209; charitable, Atlantic City, 209. *Scrofula*, prevention of, 323. *Scrofulous*, lymphatic glands, infection of, by tubercle bacilli, 323; lymphatic glands, swelling, 323; lymphatic glands, tuberculous, 323. *Scrofulous and weakly*, affection of eyes in, 381; baths, brine waters, 259; sanatoriums for, charitable, 259; sanatoriums, seaside, 326. See also *Scrofula*.
 Children's Seaside Home, Atlantic City, 259, 326
 Chile, 52
 Chini, 33
 Chlorosis, 270; cause, defect in development of various organs, 273. *Treatment*, climatic, 271; home, 271; medical supervision in, 272; resorts, high altitude, Santa Catarina, 270; resorts, high altitude, St. Moritz, 272; spas, Homburg, 271; spas, Kissingen, 271; waters, Harbin Hot Sulphur Springs, 197; waters, Napa Soda Springs, 197; waters, Royat, 272. See also *Anemia*.
 Chocorua Lake, 97
 Cholelithiasis, 350; chronic, mineral waters, 352; mineral water health resorts, 351. See also *Gall-stones*, etc.
 Cholesterin, increased formation, 350
 Christchurch, 44
 Chronic articular rheumatism, 287 (see *Rheumatism*; and *Diseases*); bronchitis and pulmonary affections, whey, 250 (see also *Bronchitis*; and *Respiratory Organs, Diseases*); diarrhea, 346; digestive disorders, 341. See *Digestive Apparatus, Diseases*.

Cimiez, 277
 Cincinnati, 64
 Cincinnati, 158
 Cincinnati University, 215
 Circulatory system, diseases, 263, 336; 372, 386. See *Heart*.
 Citronelle, 152
 City of Mexico, 219
 Claremont, 25
 Clark University, 216
 Clayford Chalybeate Springs, 132
 Clayton Lake, 109
 Clear Lake (Cal.), 198
 Clear Lake (N. Y.), 113
 Cleveland, 158; schools of, 216
 Clifton Forge, 131
 Clifton Springs, 117, 131
 Climacteric period in men, 299; period in women, 299. See also *Periods of Life*.
 Climate, Aiken, driest east of Rockies, 138; Andean, advantages, 51; Argentina, diversity, 54; Australia, diversity, 38; Bogota, compared with Malaga, 60; California, influence of ocean currents on, 189; California, southern coast, influenced by Japan current, 189; Canadian, general features, 80; Central America, diversity, 62; Chilean, diversity, 52; Florida, advantages, 144; Florida, disadvantages, 144; Hawaii, 223-225; Michigan, modified by lake front, 160; Minnesota, influence of moisture on, 164; New Hampshire, twofold, 90; Ontario, influence of Great Lakes on, 80; Pacific and Atlantic seaboard of United States compared, 188; South Africa, disadvantages, 24; Washington State compared with south of England and Channel Islands, 200; Wisconsin, modified by lake front, 162; Yuma (Ariz.) compared with Cairo, Egypt, 182
 Climates, agreeable, Guatemala City, 65; Santiago, 52; healthful, Gardiner's Island, 102. Bracing, Castilla Hot Springs, 186; Catoosa Springs, 140; Gravenhurst, 81, 82; La Pas de Ayacucho, 55; Waupaca, 164; bright, Canterbury Plains, 44; healthful, Colorado, 172. Changeable, Arquipa, 56; Michigan, 160; Wisconsin, 162. Coast, cool sedative, North America, 78; Olympia, 78; Portland, 78; Seattle, 78; Tacoma, 78; cool stimulant, Lake-wood, 77; Maine, 77; New Hampshire, 77; New Jersey, 77; North America, 77; north shore of Massachusetts, 77; resorts on Long Island Sound, 77; resorts on Narragansett Bay, 77; San Francisco, 77; western end of Cape Cod, 77; moist and equable, Argentine Republic, 54; unhealthy, Belize to Santo Tomas, 65; Honduras, 64; Jamaica, 66; warm, Central America, 62; sedative, Coronado, 77; North America, 77; San Diego, 77; shores of Florida, 77; shores of Georgia, 77; shores of Gulf of Mexico, 77; shores of South Carolina, 77. Cold damp, Halifax, 83; Newfoundland, 83. Cool, Cape Breton, 82; Castine, 88; Jamaica, elevated region, 66; Jauja, 55; bracing, Campobello, 86; Central America, interior, 62; Hot Springs (S. D.), 166; dry, Banff, 79; Bitter Root Valley, 185; Calgary, 79; Colorado, mining regions, 79; Colorado Springs, 79; Denver, 79; Field, 79; Glacier, 79; Idaho, 79; Lake Tahoe, 79; Manitou, 79; Montana, 79; Nevada, 79; Parramatta, 40; Poland Springs, 95; Rossland, 79; Salt Lake City, 185; Yellowstone Park, 79; equable, California coast belt, 190; invigorating, Lake Superior, 162; Lookout Mountain, 153; moderately moist, Mountain Lake, 79; Roan Mountain, 79; moist, equable, Friendly Islands, 48; Tasmania, 42; ocean, Nova Scotia, 83; pleasant, Managua, 64; salubrious, interior Honduras, 64; stim-

ulating, Cloudland, 152; Denver, 175; Kennebunkport, 90; Lake Chelan, 201; Prince Edward Island, 84. Delightful, Louisville, 156; Santa Barbara, 193; marine, southeastern coast of Massachusetts, 91; salubrious, Napa Soda Springs, 197. Desert, Arizona, 180; Egypt, 17; Helouan, 19; Luxor, 20. Differences, Argentine Republic, 54; Australia, 39; New England, 86; Tasmania, 43. Dry, Bolivia, 55; Cresson, 125; Kansas, 155; Sea Point, 25; bracing, Calgary, 85; Canada, 81; Summerville, 140; north of India, 37; cold, Hawaii, 48; equable, Boerne, 150; Morris-town, 121; Napier, 45; stimulating, mountain, Las Vegas, 169; tonic, Zacatecas, 220; winter, Richmond, 128. Enervating, Puerto Rico, 70. Equable, Cartago, 63; Idyllwild, 194; Martha's Vineyard, 92; Tampa, 148; humid, Santa Catalina Island, 191; moist, Tarpon Springs, 147; sedative, Monterey, 196. Equatorial, Rio de Janeiro, 57. Excellent, Atlanta, 139; El Paso, 151; Prescott, 183. Exhilarating, at slight elevation, Jamaica, 67; Kamloops, 85; moderately warm, Chattanooga, 153. Favorable, Charleston, 142; San Luis, 179. Genial, Gilroy Hot Springs, 197. Good all-year-round, Cradock, 27; Mexico, central plateau, 219. Healthful, Barbados, 72; Cincinnati, 158; Salvador, table-lands, 65; Shelter Island, 102. High altitude in Arizona, 180; invigorating, Carnelian Hot Springs, 198. Hill, Indian Empire, 31. Humid, Costa Rica, 63. Inland, high elevation, cool and dry, North America, 79; and moderately moist, North America, 79; warm and dry, Central America, 79; North America, 78; northern Arizona, 78; northern New Mexico, 78; southern Colorado, 78. Inland, low elevation, cool and moderately dry, Berkshire district, 78; Muskoka Lake region, 78; North America, 78; North Dakota, 78; northwestern Connecticut, 78; South Dakota, 78; Southern Minnesota, 78; Wisconsin and central Michigan, pineries in, 78; cold and moist, Duluth, 78; North America, 78; northern California, 78; Port Arthur, 78; Sault Ste. Marie, 78; Washington, 78; western Oregon, 78; Winnipeg, 78; cool and moist, valley of St. Lawrence, 78; desert, Mojave Desert, 78; North America, 78; warm and dry, Aiken, 78; Florida, interior, lake district, winter, 78; New Jersey pine region, 78; North America, 78; Ojai Valley, 78; Pasadena, 78; Phoenix and Salt River Valley, 78; Redlands, 78; Riverside, 78; San Bernardino, 78; San Gabriel, 78; Thomasville, 78; Yuma, 78; warm and moist, eastern and central Texas, 78; eastern Arkansas, 78; Louisiana, 78; Mississippi, 78. Inland, moderate elevation, El Paso, 78; Mount Kinco, 78; cool and dry, eastern Oregon and Washington, 78; North America, 78; southern Wyoming, 78; valleys of Idaho and Montana, 78; cool and moist, Adirondack Mountains, 78; Deer Park, 78; Eaglesmere, 78; North America, 78; North Carolina, 78; Pocono (Pa.), 78; western Virginia, 78; White Mountains, 78; moderately warm and dry, Asheville, 78; warm and dry, Guadalajara, 78; Las Cruces, 78; Mesilla and Lower Pecos valley, 78; Monterey, 78; North America, 78; portions of southeastern California, 78; southern Arizona, 78; southern New Mexico, 78. Insular, Auckland Islands, 47; cool, windy, Islesboro, 89; equable, marine, Cape May, 106; marine, Isle of Shoals, 91. Invigorating, Asheville, 136; Chautauqua Lake, 116; Maine coast, 87; Mount Desert Island, 87; Rotorua, 46. Lowland, influence of, on pulmonary tuber-

- culosis, 173. **Marine**, Fire Island, 102; cold stimulant, Campobello, 77; Cape Breton, 77; extremity of Cape Cod, 77; cool stimulant, Isles of Shoals, 77; Long Island, 77; Martha's Vineyard, 77; Nantucket, 77; Newfoundland, 77; North America, 77; Nova Scotia, 77; south shore of Mount Desert, 77; equable, Block Island, 92; Nantucket, 92; moderately cool, Channel Islands of California, 77; North America, 77; warm, moist, equable, Bahamas, 71; warm sedative, Bahamas, 77; Bermuda, 77; North America, 77; West Indies, 77; warm sunny, Avalon (Cal.), 192. **Mild**, Cumberland Island, 143; Oregon, 190; Pacific Coast of United States, 188; Tucson, 183; equable, Quito, 59; healthful, Nebraska, 155; southern slope of Ohio, 157; moist, Brunswick, 143; sunny, Nelson, 45; warm, Savannah, 143. **Moist**, Lima, 50; Para, 58; equable, Grahamstown, 26; unhealthful, Trinidad, 72; humid and sedative, Auckland, 44; sedative, Portland, 199; temperate, New Zealand, 44. **Relaxing**, Auckland, 44; Galveston, 149; insular, Fiji Islands, 48. **Salubrious**, Denver, 174; Missouri, 153. **Seaboard**, modified, Pennsylvania, 122. **Semiotropic**, Florida, 144; Mississippi, 148. **Sheltered**, Fauquier White Sulphur Springs, 130; winter, Valley of Virginia, 129. **Stimulating**, Alexandria (Minn.), 165; Glacier, 85; Kane, 124; Maine, 96; Marquette, 161; dry, Winnipeg, 84; high altitude resorts, Nevada, 187; tonic, Saratoga, 114. **Subtropical**, lower California, 190. **Summer**, Australian littoral region, 40; cool, bracing, Wisconsin, 162; cool dry, Washington, 199; cool equable, southeastern coast of Massachusetts, 91; delightful, Louisville, 156; harsh chilly, San Francisco, 195; moderate, Bitter Root Valley, 185; warm dry, eastern Washington, 200; Redlands, 194; warm moist, Bay St. Louis, 148; Pass Christian, 148. **Temperate**, elevated interior, Colorado Springs, 177; Cuba, 68. **Tonic**, Berkshire Hills, 98; and mildly exhilarating, Berkshire Hills, 99. **Torrid**, low coast-line, Cuba, 67. **Tropic**, Miami, 147; Palm Beach, 147. **Unhealthful**, Louisiana, 149; Port-au-Prince, 71. **Unsuitable** for delicate persons, New England, 86. **Variable**, Honduras, 64; bracing, Minneapolis, 165; St. Paul, 165; healthful, Alabama, interior, 152; pleasant, Louisville, 156. **Variations**, Brazil, tableland, 57; California, 188; Canada, 79; New Zealand, 44; United States, 79. **Warm dry**, Arizona, 179; Coronado Beach, 190; Durango, 221; San Diego, 19; dry windy, Assouan, 20; equable, Saltillo, 221; southern California, 189; moist, Washington, 127; moist bracing, Sao Paulo, 58; moist equable, West Indies, Bermuda Islands, 74; Jamaica, 66; moist equable marine, Society Islands, 47; sunny, Cairo, 18; sunny dry, Australian inland plains, 41. **Winter**, Coronado Beach, 190; cold, Missouri, 153; cold dry, eastern Washington, 200; mild, Bay St. Louis, 148; Calabesas, 181; Crittenden, 181; Farmville, 129; Hammon, 120; Huachuca, 181; Lakewood, 120; Las Cruces, 171; Nogales, 181; Pasadena, 192; Pass Christian, 148; Phoenix, 182; Tombstone, 181; Tucson, 183; Vineland, 120; mild relaxing, Jamaica, 66; moist unfavorable, Cleveland, 158; severe, Arizona, 180; Bitter Root Springs Valley, 185; warm dry, Upper Egypt, 20; warm moist, Washington, 199. **Climatic characteristics**, Adirondacks, 110; Arizona, 181; California, 188, 190; Canada, 81; Colorado, 171, 172; Egypt, 21; Florida, 144; hill stations, India, 31; Long Island resorts, 101; Mexico, 219; New England, 86; New Jersey coast, 103; North Carolina, 135; Ohio, 157; Pacific slope, 188; Rhode Island, 94; Riverina plain, 41; South Africa, 23; South America, 50; South Australia, 39; Texas, 149; Washington, 200. **Climbing exercise**, 246; exercise in cardiac affections, 246, 339. **Clothing needed**, Arizona, 180; needed, Florida, 145; needed, Roturua, 46; suitable generally, 254. **Cloudcroft**, 171. **Cloudland**, 152. **Cloverdale Lithia Spring**, 126. **Coast Mountains**, 79, 190, 192, 197. **Coast**, northern California, influenced by cold return current, Kurosiwo, 189; southern California, influenced by warm Japan current, 189; Washington, most humid part of United States, 199. **Resorts**. See *Health Resorts, Coast*. **Coast Range Mountains**, 78, 79, 85, 190, 192, 197, 369. **Coastal zone**, United States of Colombia, dangers, 59. **Coast-line of California**, length, 188, 189. **Coe, Dr. W. H.**, 109. **Cohen, S. Solis**, 38, 263, 287, 308, 314. **Cold**, effects of, on delicate persons, 263, 386 (see also *Respiratory Organs, Diseases*); weather, Mediterranean trip, 254; zone of Mexico, 219. **Cold Spring Harbor**, 102. **Cold Springs (N. Y.)**, 115. **Cold Sulphur Springs (Va.)**, 131. **Colds rare in Sao Paulo**, 59. **Colemanville Mineral Springs**, 129. **Colgate University**, 217. **Colic**, biliary, 352. **Colon**, 63. **Colorado**, 78, 167, 171, 194; diseases met with in, 172; effects of, on different individuals, 173; counter-indications, 317. **Colorado River**, 181. **Colorado Springs**, 79, 176, 301, 319, 335. **Columbia (Mo.)**, 218. **Columbia Falls**, 87. **Columbia River**, 201. **Columbia University**, 215, 216. **Comañilla**, 221. **Como (N. J.)**, 103. **Concord**, 97. **Concretions**, biliary, 350; urinary, 358. See also *Calculi; Gall-stones; and Urinary Organs, Diseases*. **Coney Island**, 102. **Conjunctiva and cornea**, affections, in scrofulous and weakly children, 381. See also *Children, Scrofulous and Weakly, and Scrofula*. **Connecticut**, 78, 94, 99. **Conoor**, 36. **Constipation**, chronic, 345; chronic, associated with dyspepsia, 344. **Chronic**, waters, Blue Lick Mineral Springs, 156; Carleian Hot Springs, 198; Salt Sulphur Springs, 133; Saratoga, 114; Sheboygan Mineral Well, 163. **Grape cure**, 252. Of neurasthenia, waters, Bedford Springs, 125. See *Digestive Apparatus, Diseases*. **Constitution of patient as element in selection of health resort**, 262; reactive powers of, 262; strong, compared with weak, 262; strong, effect of underfeeding on, 262; weak, compared with strong, 262; weak, effects of over- and underfeeding on, 262. See also *Patients, Consumption*. See *Tuberculosis, Pulmonary*. **Contrexéville**, 285, 296, 358. **Convalescence**, after appendicitis, simple thermal baths, Plombières, 269; brine baths in,

269. Constipation after, aperient muriated waters, Greenbrier White Sulphur Springs, 270. Debility and hemic disorders, 267. Delayed, baths, mud and peat, 269; country districts, 268; hydrotherapeutic treatment, 269; inland summer resorts, 268; mineral water health resorts, 269; ocean voyages, 268; seaside health resorts, 268; waters, mineral, internal use, 269; waters, chalybeate, 269; winter resorts, 268. From acute diseases, 267; Atlantic City, 106; Bahamas, 72; Old Point Comfort, 108; Summerville, 140. From bronchitis, waters, muriated alkaline, 269; Tarpon Springs, 147. From chronic illness, Mount Desert Island, 87. From debility, general, Lake Pontchartrain, 148. From diseases of the respiratory organs, Block Island, 94; Cape May, 107; Nantucket, 94; Vineyard Haven, 94. From localized peritonitis, simple thermal baths, Plombières, 269. From malaria, Lake Pontchartrain, 148. From nervous diseases, Tarpon Springs, 147. From pneumonia, Lake Pontchartrain, 148; Tarpon Springs, 147. From pulmonary diseases, Sanatorium Gabriels, 321.
- Convalescents, Bermuda, 76; Cumberland Island, 143; health resorts for, 270; Lake Minnetonka, 165; precautions for, 270; southeastern coast of Massachusetts, 92.
- Convulsions, infantile, death from, in Philip-pines, 49.
- Conway, 97.
- Coolbaugh, 122.
- Coonoor, 36.
- Cooperstown, 118.
- Copiate, 52.
- Coquindo, 52.
- Cordilleras, 219.
- Cordoba (Argentina), 54.
- Cornu, 23.
- Cornell University, 217.
- Cornwall (N. Y.), 115.
- Coronado, 77, 190, 268, 278, 340, 359.
- Coronado Beach, 190.
- Corrientes, 54.
- Costa Rica, 63.
- Cotswold Hills, 258.
- Cottage City, 91, 92.
- Coughs, Atlantic City, 106; rare in Sao Paulo, 58.
- Crab Orchard Springs, 156, 272, 345, 380.
- Cradock, 26, 27.
- Cranberry, 137.
- Crater Cañon, 183.
- Crawford, 333.
- Crawford House, 97.
- Crawfords, 96.
- Cresco, 123.
- Cresson, 125.
- Cretinism in Vilcamayo Valley, 57. See also *Children, Cretinoid and Backward*.
- Cripple Creek, 174.
- Crittenden, 181.
- Crockett Arsenic-Lithia Spring, 132.
- Crook, J. K., 127, 140, 141.
- Croupous pneumonia mistaken for mountain fever, Rocky Mountain region, 168. See *Pneumonia; and Respiratory Organs, Diseases*.
- Croydon Mountain, 98.
- Crumpler, 374.
- Cuba, 66, 67, 77.
- Cullimore, 33, 36.
- Cumberland, 127.
- Cumberland Island, 143, 331.
- Cure, dietetic, mineral water health resorts, 247; grape, Montreux, 251; quantity to be prescribed, 251; milk, whey, and kumiss, 251; topographic (Terrain-Cur), 246, 339.
- Currituck Sound, 135.
- Curtin, Dr. R. G., 168.
- Cutaneous diseases, waters, Blue Lick Mineral Springs, 156; diseases, chronic, waters, Agua Caliente, 182. See also *Skin, Affections*.
- Cutchogue, 101, 102.
- Cuyamaca Mountains, 191.
- Cuzco, 56.
- Cystitis, 358; gouty, mineral waters, 358; prevalent, Arizona, 180; waters, Mardela Springs, 127; waters, Napa Soda Springs, 197. See also *Kidney; and Urinary Organs, Diseases*.

D

- Daggers Springs, 131.
- Dagshai, 33.
- Dakota, North, 83, 166.
- Dakota, South, 83, 166.
- Dalhousie, 333.
- Danbury, 99.
- Daniell, Dr., 26.
- Dansville, 116.
- Darjeeling, 31, 33.
- Darling Downs, 42.
- Dartford, 163.
- Dartmouth College, 216.
- Davidson, 65.
- Davos, 257, 319.
- Davos Platz, 194.
- Daytona, 146.
- Dead Sea, 186.
- Deafness, functional, 382. See *Ear, Affections*.
- Deal Beach, 103.
- Death-rate, Chile, 53; Denver, comparisons, 176; Havana, from different diseases, 69; from yellow fever among Spanish soldiers in Cuba, 69; from dysentery in Cuba, 69; from enteritis in Cuba, 69; from pulmonary tuberculosis in Bermuda, 76; from pulmonary tuberculosis in Colorado, 174; from pulmonary tuberculosis in Cuba, 69; from pulmonary tuberculosis in New Hampshire, 90.
- Debility, general, Avalon, 192; Camden (S. C.), 138; White Mountains and adjacent regions, 97. Anemia and, 270; diet and exercise in, 275; inland resorts of moderate elevations, 275; massage for, 275; seaside resorts, warm, 275; thermal spas, simple, 275; Weir-Mitchell treatment, modified, 275. Convalescence from, Lake Pontchartrain, 148.
- Decay, prevention, 300. See also *Age; Old; and Periods of Life, Various*.
- Deer Isle, 89.
- Deer Lick Spring, 374.
- Deer Park, 78, 127.
- Deer Park Inn, 187.
- Delaware, 107.
- Delaware (O.), 218.
- Delaware Bay, 106.
- Delaware River, 104.
- Delaware Water Gap, 121, 122.
- Delicate invalids, Greenbrier White Sulphur Springs, 133.
- Deming, 170.
- Denilguin, 42.
- Denver, 38, 79, 174, 207, 208, 301; disadvantages of, as a health resort, 174; compared with New York, 174, 175; winds, temperature, barometer, humidity, compared, 175.
- De Pauw University, 218.
- Depression, mental, climatic treatment, 367. See also *Nervous System, Diseases*.
- Dermatitis. See *Skin, Affections*.
- Derscheid, G., 306.
- Desert climate of Egypt for pulmonary tuberculosis, 21, 312.

- Des Moines, 218
 Detroit, 161
 Dettweiler, 257
 Devil's Lake (N. D.), 166
 Devil's Lake (Wis.), 163
 Dexter, 174
 Diabetes, *Insipidus*, 373; *chalybeate* and *arsenical* spas, 373; climatic health resorts, 373. *Mellitus*, climatic treatment, 204; sanatoriums, 204; waters, Harris Lithia Springs, 139; waters, Poland Springs, 95; waters, Waukesha, 163. *Mellitus* and *glycosuria*, 293; benign forms, 293; grave forms, 294; mild cases, 295. Mild, cruises, 296; mineral water health resorts, Carlsbad, 295; Neuenahr, 295; Vichy, 295; sanatorium treatment, 295; sea voyages, 295. See also *Metabolism, Disorders*.
 Diarrhea, Block Island, 94; Nantucket, 94; Vineyard Haven, 94. Chronic, 346; Egypt unsuitable, 23; Ojai Valley, 195. Waters, Hunter's Pulaski Alum Springs, 132; Old Sweet Springs, 133; Rockbridge Alum Springs, 131. See *Digestive Apparatus, Diseases*.
 Diatheses and toxemias, certain, health resorts, 279; gout and gouty conditions, 283; poisoning, chronic metallic, 283; rachitic and weakly children, 279; syphilis, 279. See also *Children, Rachitic and Weakly; Syphilis, etc.*
 Diathesis, strumous, waters, St. Clair Springs, 161
 Dickinson College, 217
 Diet, 247; importance of, at mineral water health resorts, 247
 Dietetic establishments, 255
 Digestive apparatus, diseases and disorders, 341. Catarrh, chronic, of the rectum, 348. Cholelithiasis, mineral water health resorts, 350. Constipation, habitual, treatment by diet, massage, and drugs, 345; treatment, spa, sulphated alkaline, 346. Diarrhea, chronic, 346; climatic treatment, 347; due to colitis, 347; due to weak mucous membrane, 346; sanatorium treatment, 347; with intestinal catarrh, 346. Digestive disorders, chronic, climatic treatment, Serrezuela, 61; diet, 247; drinking water, 342; exercise, 342; food, 341; medicinal treatment, 249; milk cure, 250; sanatorium treatment, 341; sea air unsuitable, 342; seaside, influence of, 248; waters, Glen Springs, 139; Missouri, 153; St. Clair Springs, 161. Dyspepsia associated with chronic constipation, 344; associated with neurasthenia, 344; atonic, 345; from abuse of tobacco and alcohol, 345; climatic treatment, 248, 343; in mental and nervous disorders, climatic treatment, 344; mineral waters, 344; nervous, 345; with gouty tendency, 345. Hemorrhoids, 348. Liver, congestion and enlargement, 348; functional disorders, 349. Liver and bile-ducts, affections, 348. Pruritus ani, 348. Stomach and intestines, irritation and chronic catarrhal conditions, 344
 Dingman's Ferry, 122
 Diphtheria in Santiago, 53; in Valparaiso, 53
 Diseases, chronic, Alma Sanatorium, 161; chronic, Waldheim Sanatorium, 163; chronic, not tuberculous, Martha's Vineyard, 92; of the circulatory system, 336; of nervous centers, organic, due to syphilitic changes, 365; of the nervous system, 364 (see *Nervous System, Disorders*); of the urinary organs, 353 (see *Urinary Organs, Diseases*); prevalent in Mexico, 219; tropic, of Florida, 145; wasting, waters, Harbin Hot Sulphur Springs, 197. See *Endemic*; also *Fever*.
 Disorders of the nervous system, 364; of the menopause, 363; of metabolism, 291; of the sexual system, 360. See *Sexual System, Disorders, etc.*
 District of Columbia, 127; chief town, 210
 Dixville Notch, 96, 333
 Dobbs Ferry, 115
 Dodge City, 155
 Dominica, 73
 Don River, 82
 Donner Lake, 187
 Douches, 269; Caledon, 26; for gout, 284; for neuralgia and neuritis, 369, 370; for metallic poisoning, 283; for rheumatism, 287; for syphilis, 280; Helouan, 22; waters, Glenwood, 178; waters, Richfield Springs, 117
 Drake University, 218
 Dresden, 301
 Drexel Institute, 215
 Drinking-water, pure, importance of, in dyspepsia, 342
 Duarte, 193
 Dublin, 329
 Duckworth, Sir Dyce, 284
 Duluth, 78, 162
 Durango, 221
 Durkheim-an-der-Hardt, 252
 Dust, alkali, Arizona, 180
 Dust-storms, San Gabriel Valley, 193; winter, Las Vegas, 169; winter, Tucson, 183
 Dysentery, Egypt unsuitable, 23; Sucre, 55; chronic, Block Island, 94; chronic, Nantucket, 94; chronic, Vineyard Haven, 94; endemic, Philippines, 49; prevalent, 219; waters, Hunter's Pulaski Alum Springs, 132; Old Sweet Springs, 133
 Dysmenorrhea, climatic and mineral water treatment, 362; mud-baths, 362; waters, Yellow Sulphur Springs, 132. See *Sexual System, Disorders*.
 Dyspepsia, Glen Summit, 123. Associated with cardiac weakness, 345; chronic constipation, 344; neurasthenia, 250, 344; renal disease, 250, 343. Atonic, and anemia, 345. Due to alcohol and tobacco, 345; anemia, waters, Nye Lithia Springs, 132; overwork, Egypt, 21; overwork, ocean voyages, 344; weak mucous membrane, 343. Gouty and plethoric cases, 250, 343, 345. Nervous, 344. Waters, Berkeley Springs, 134; Blue Lick Mineral Springs, 156; Capon Springs, 134; Check's Springs, 139; Highland Springs, 198; Hunter's Pulaski Alum Springs, 132; Indian Springs, 140; Klamath Hot Springs, 198; Mardela Springs, 127; Pluto Spring, 159; Saratoga, 114. See also *Digestive Apparatus, Diseases and Disorders*.
 Dyspeptic conditions, milk cure, 250
- E
- Eaglesmere, 78, 124
 Ear affections, 381; affections, deafness associated with hysteria or neurasthenia, 382; deafness due to senility, 383; degenerative changes due to senility, 383; internal, Ménière's symptoms and disorders, treatment by climates and health resorts, 382; middle, chronic and purulent discharges from, 381; middle, chronic catarrhal conditions, douches, sprays, and inhalations, 382; middle, chronic dry catarrh, sulphated alkaline spas, 382
 East Bay, 100
 East Hampton, 102
 East Las Vegas, 169
 East Machias, 87
 East Orange, 121
 East Rock, 95
 Easthampton, 101
 Eastport, 90
 Eaux-Bonnes, 269, 312, 330

Echo Lake, 97
 Echo Mountain Chalet, 193
 Ecuador, 59; health resorts of, high altitude, 50
 Eczema, 383; climatic treatment, 384; mud
 baths, Mudlavia, 159. See also *Skin, Affec-
 tions*.
 Eddy, 171
 Eden, 40
 Eden Lake, 146
 Edge Cove, 103
 Edinger, 281
 Egeria Park, 179
 Egypt, 17, 182, 254, 283, 355; counterindications,
 23; indications, 21; Upper, 20
 Egyptian climatic features, 21
 El Paso, 78, 150
 El Paso de Robles, 347
 Elberon, 103, 104
 Electric-light baths. See *Baths*.
 Elizabethtown, 111, 113, 329
 Elk Lithia, 356
 Elkhart, 163
 Elkhart Lake, 163
 Elkhorn Lodge, 178
 Elster, 274, 299, 346
 Emery, Professor S. M., 185
 Emissions, nocturnal, chalybeate spas, 360;
 nocturnal, climatic treatment, 360. See also
Sexual System, Disorders.
 Emphysema, Egypt, 21, 22. See also *Respira-
 tory Organs, Diseases*.
 Ems, 131, 269, 301, 363
 Endemic diseases not prevalent in the Society
 and Sandwich Islands, 47; diseases, prevalent
 in Central and South America, 53, 54, 56, 57,
 59, 62, 63; in the Solomon Islands and New
 Hebrides, 47; in the West Indies, 66, 69, 71
 Engadine, 378
 England, 190
 English Antilles, 66
 Enterocolitis of children, Block Island, 94;
 Nantucket, 94; Vineyard Haven, 94
 Entre Rios, 53, 54
 Epilepsy, colonies, 365; sanatoriums, 365. See
Nervous System, Disorders.
 Equinox water, 356
 Erie, 122
 Erie, Lake, 80, 81, 157
 Erckenbrecker's Salt Well, 159
 Escanaba, 161
 Essex County, 119
 Estes Park, 178, 179
 Evanston, 216
 Exercise, 246; climbing, 246, 339; methodic
 muscular, of Dr. Frenkel, 369; Schott's re-
 sistance, 372. See *Open-air; Out-of-doors*,
 etc.
 Exhausted bodies and brains, Maine woods,
 96. See *Depression; Fatigue; Neurasthe-
 nia*, etc.
 Exophthalmic Goiter, 371. See *Graves's Dis-
 ease*.
 Eyes, affections, associated with anemia, spa
 treatment, 381. *Affections*, climatic treat-
 ment, 381; in gouty persons, sulphated alka-
 line waters, 381; in scrofulous and weakly
 children, 381; sulphur baths, 381; waters,
 Proserpine Spring, 159. *Ears, and skin*, af-
 fections, 381. See *Ears; Skin*.
 Eye-water spring, 381

F

Faber, 311
 Fairmount Park, 208, 339
 Falkenstein, 257, 258
 Fallsburg, 116
 Fatmouth (G. B.), 353
 Falmouth (Mass.), 91

Fango, 288
 Farmville Lithia Springs, 129, 356
 Fauquier White Sulphur Springs, 130, 272
 Fayetteville, 133
 Fayrer, Sir Joseph, 31, 32, 34
 Febrile diseases, Monterey (Cal.), 196. See
Convalescence; and Fever.
 Fever, anemic, in Peru, 56; Haitien, 71; inter-
 mittent, at Bogota, 60; intermittent, at Lima,
 56; intermittent, at Rio de Janeiro, 57; Malta,
 at Puerto Rico, 70; mountain, 167; Oroya, in
 Peru, 56; typhoid, in Bolivia, 55; typhoid,
 in Cairo, 18; typhoid, in Sucre, 55; yellow,
 in Campinas, 59; yellow, in Cartagena, 59;
 yellow, in Central America, 63; yellow, in
 Costa Rica, 63; yellow, in Cuba, 69; yellow,
 in Florida, 145; yellow, in Honduras, 64;
 yellow, in New Orleans, 214; yellow, in Rio
 de Janeiro, 57
 Fever-level, Indian hill stations, 31
 Field, 79, 84
 Fiji Islands, 47
 Fire Island, 102
 Fish River, 96
 Fisher's Island, 95
 Fishkill, 115
 Flagstaff, 181, 183
 Flimser-Waldhäuser, 381
 Flint Stone Springs, 127
 Florence, 277, 367
 Florida, 77, 78, 141, 144, 270, 277, 294, 308, 325,
 331, 353, 355, 359, 367, 378
 Flowing Spring, 131
 Flushing (L. I.), 102
 Forest Reserve Association, 164
 Formosa, 54
 Forsyth Park, 143
 Fort Apache, 179
 Fort Bayard, 170, 322
 Fort Castine, 88
 Fort de France, 73
 Fort George, 88
 Fort Grant, 184
 Fort Moultrie, 142
 Fort Smith, 154
 Fort Stanton, 170, 322
 Fort Steele, 184
 Fort Sumter, 142
 Fortress Monroe, 108
 Foster, M. G., 265
 Fountain Geyser, Yellowstone Park, 184
 Fountain Park Magnetic Springs, 159
 Franconia Notch, 97
 Frankfurt-am-Main, 255
 Franklin, 87
 Franzensbad, 274, 297, 299, 330, 361
 Freehold, 119
 Free Home for Consumptives, Boston, 321;
 Hospital for Poor Consumptives, Pennsyl-
 vania, 123, 321
 French Broad River, 136
 French Lick Springs, 159, 274, 351
 Frenchman's Bay, 88
 Frenkel, Dr., 247
 Friedrichshall, 345
 Friendly Islands, 48
 Fulton chain of lakes, 111
 Funchal, 72
 Furunculosis, chronic, associated with glyco-
 suria and mental worry, sea voyages, 386;
 chronic, climatic treatment, 386
 Fusagasuga, 60, 61

G

Gabriel's Post-office, 112
 Galen, 393
 Gallatin Valley, 185
 Gall-bladder, inflammation, spa treatment, 352.
 See also *Digestive Apparatus, Diseases*.

- Galloping consumption, 318
 Gall-stones, spa treatment, 351. *See also Digestive Apparatus, Diseases.*
 Galveston, 149, 150
 Garden of the Gulf, 84
 Gardiner's Bay, 100
 Gardiner's Island, 102
 Gardone-Riviera, 277, 308
 Garrison, 115
 Garrod, Sir A. B., 289
 Gastein, 278, 296, 298
 Gastric disorders, climatotherapeutics, 248, 341; disorders, waters, Topo Chico, 221
 Gastro-intestinal disturbance, 248. *See Digestive Apparatus, Diseases and Disorders.*
 Gautier, Armand, 373
 Gee, Dr. S., 250, 356
 Genda Springs, 155, 348
 General Hospital for Treatment of Pulmonary Tuberculosis, 322
 General paralysis, 368. *See also Nervous System, Diseases.*
 Geneva (Wis.), 163
 Geneva Lake (Wis.), 163
 Geneva Lithia Water, 358
 Georgetown (D. C.), 210
 Georgetown University, 216
 Georgia, 77, 139, 142
 Germantown, 209
 Gettysburg, 126
 Geyser Spa, 272
 Giesshübler, 356
 Gila Valley, 180, 182
 Gilkey's Harbor, 88
 Gilroy, 197
 Gilroy Hot Springs, 197
 Ginders, Dr. A., 46
 Gippsland in Victoria, 40
 Girard College, 215
 Glacier, 79, 85
 Glassford, 181
 Gleet, chronic, 359. *See Sexual System, Diseases.*
 Gleichenberg, 338
 Gleisweiler, 252
 Glen Cove, 102
 Glen Springs (N. Y.), 374
 Glen Summit, 123, 302, 358
 Glenbrook, 187
 Glenn Springs (S. C.), 139
 Glenola Springs, 129
 Glenwood, 178, 334
 Glenwood Springs, 368
 Glion, 298, 334
 Glockner Sanatorium, 322
 Glycosuria, alimentary, 294. Gouty, baths, simple thermal, 296; massage and Swedish gymnastics, 296; waters, 296. Mild, Egypt, 22. Nondiabetic, 293. Temporary, 293. *See also Diabetes; Metabolism, Disorders of.*
 Goerbersdorf, 257, 319
 Gogebic Lake, 333
 Goiter, climatic treatment, 373; immunity of seaside places, 372; waters, mineral, containing iodine, 372; in Bolivia, 55; in Vilcamayo Valley, 57
 Goiter-water, 372
 Gold Mountains, 85
 Golden Gate, 195, 196
 Gonorrhea, sequelæ, sea voyages, 359. *See also Sexual System, Diseases.*
 Gordontown, 66, 67
 Gortschakoff, Prince, 301
 Gout and gouty conditions, 283; baths, 285; Hot Sulphur Springs, 186; Greenbrier White Sulphur Springs, 134; Hot Springs (Va.), 130; baths, mud, Hot Mud Springs, 198; Mud-lavia, 159; climatic treatment, 284; diet, 249; mineral water health resorts, 284; sea air, unsuitable, 284; waters, Berkeley Springs, 134; Blue Lick Mineral Springs, 166; Burner's Springs, 130; Jordan White Sulphur Springs, 130; Klamath Hot Springs, 198; Farmville Lithia Springs, 129; Hot Springs (Va.), 130; Richfield Springs, 117; Topo Chico, 221; Utah Hot Sulphur Springs, 186; Warm Springs (Ga.), 140; Waukesha, 163. Chronic, Egypt, 22; baths and douches, Helouan, 22; waters, Bedford Springs, 125
 Gouty conditions, baths, thermal, Rotorua, 46; milk cure, 250; mineral waters, 249; waters, Caledon, 26; waters, Gettysburg, 126; waters, Glenwood, 178. Diabetes, waters, Bedford Springs, 125. Dyspepsia, waters, Farmville Lithia Springs, 129. Glycosuria, 296, 349. Urethritis, 359. *See also Digestive Apparatus, Diseases; Glycosuria; and Skin Diseases.*
 Grady, Henry W., 140
 Grahamstown, 26
 Grand Haven, 161
 Grand River, 161
 Granite Lake, 97
 Granite State, 90
 Grape cure, 248, 251, 252; cure, chest diseases, 252; cure, medical advice essential, 252; cure, resorts, 252; cure, season for, 252
 Grasse, 277, 334
 Gravel, phosphatic, 355; urinary, climatic treatment, 355; urinary, mineral water health resorts, 356. *See also Uric Acid; and Urinary Organs, Diseases.*
 Gravenhurst, 81
 Gravenhurst Sanatorium, 81
 Graves, 257
 Graves's disease, 372; disease, gaseous thermal muriated baths, Nauheim, 372; disease, minor forms, exercises and gymnastics, 372; disease, simple thermal spas, 372. *See also Nervous System, Diseases.*
 Great Bermuda, 74
 Great Lakes, 160
 Great Peconic Bay, 100
 Great Salt Lake, 186
 Great South Bay, 100, 102
 Greater Antilles, 66
 Green Alpine Springs, 137
 Green Bay, 163
 Green Island, 111
 Green Lake, 163
 Green Lawn Springs, 160
 Green Mountain, 87
 Green Mountain State, 98
 Green Mountains, 79, 329
 Greenboro, 140
 Greenbrier White Sulphur Springs, 133, 136, 270, 274, 371
 Greencastle, 218
 Greisbach, 329
 Grey Town, 64
 Grindstone Neck, 88
 Grinnell, 218
 Grip, sequelæ, 337; Atlantic City, 106
 Groseclose Inn, 132
 Guadalajara (Mex.), 78
 Guadalupe, 73
 Guatemala, 65
 Guatemala City, 65
 Guilbert, Alphonse, 51
 Gulf, Garden of, 84
 Gulf of California, 180
 Gulf of Mexico, 148, 152
 Gulf of St. Lawrence, 80
 Gulf Stream, 74; influence of, on eastern and southern shores of Long Island, 101; influence of, on Virginia Beach, 108; influence of, on winter climate of Atlantic City, 105
 Gurnigel, 369, 379, 381
 Gymnastics, resistance, 347

H

- Hackettstown, 122
 Hahn, 26
 Haiti, 71
 Haitian fever, 71
 Halifax, 80, 83
 Haller Kropfwater, 372
 Hamilton (N. Y.), 217
 Hamilton Hotel (Bermuda), 76
 Hamilton, Mount, 196
 Hammon, 119, 120, 268, 294, 319
 Hampton, 108
 Hampton Roads, 108, 128
 Hanover (N. H.), 216
 Hansen, Dr. J. Armauer, 164
 Harbin Hot Sulphur Springs, 197
 Harris Lithia Springs, 139
 Harris, 28, 29
 Harrodsburg, 156, 347
 Harrogate, 274, 285, 370
 Harvard University, 216
 Harvey's Cedars, 103
 Hastings (Barbados), 73
 Hastings (N. Y.), 115
 Hatteras, Cape, 74
 Havana, 68, 69, 77, 367, 378; diseases endemic, 69
 Haverford College, 216
 Havre (Mont.), 185
 Hawaii, 48; air, elevation, and population, 223; civilization, 239; climate, 223, 225; favorable for rearing of children, 241; for persons of feeble resisting powers, 241; geography, 223; malarious diseases, 240; ocean currents, 228-230; rainfall, 233; temperature, uniformity of, 225-227; therapeutic indications, 240; under American transformation, 241; wind-force and cloud-amount, 233; winds, 230
 Hawaiian Islands, 48, 223; disease and mortality in, 238. **Resorts**, and places of residence. Hilo, 239; Honolulu, 239
 Hay asthma, Lake Superior, 162
 Hayden, Professor, 168
 Hay-fever, 332; Beach Haven, 105; Fire Island, 102; Gravenhurst Sanatorium, 82; Thousand Islands, 110; Tuckerton, 105. **Immunity**, Banff, 84; Block Island, 94; Cloudland, 152; Halifax, 83; Maine woods, 96; Michigan, 161; Nantucket, 94; Newfoundland, 84; Northeast Harbor, 87; Rangeley Lakes, 96; Vineyard Haven, 94; White Mountains and adjacent regions, 96, 97; partial, Glen Summit, 123. **Treatment**, climatic, 333; local, 332; sea-voyages, 332; **waters**, Greenbrier White Sulphur Springs, 134; Haywood Sulphur Springs, 136
 Headache, bilious, 377
 Headaches, chronic or recurrent, 374; chronic, due to mental shock, work, etc., climatic treatment, 377; due to anemia and debility, 374; due to chronic affections of the pelvic organs, 375; due to chronic alcoholism and tobacco, 376; due to dyspepsia, 375; due to insufficient exercise, 375; due to venous congestion, 375; following influenza and other infectious diseases, 374; in gouty and rheumatic subjects, 374; nervous, climatic treatment, 378; sick, climatic treatment, 377
 Healing Springs, 131, 296, 363
 Health resorts for milk and whey cures, 251; resorts, grape cure, 252; resorts, selection, 260; resorts, selection, elements, constitution of patient, 261; resorts, selection, elements, inclination of patient, 264; resorts, selection, elements, journey, 263; resorts, selection, elements, season, 264; resorts, selection, for delicate persons, 263; resorts, selection, rooms and dwellings, 265
 Health resorts, Africa, 17; Antilles, Greater, 66; Antilles, Lesser, 72, 73; Argentina, 53; Asia, 31; Auckland Islands, 47; Australasia, 38; Australia, 38; Bahamas, 71; Barbados, 72; Belize, 64; Bermudas, 74; Bolivia, 54; Bombay Presidency, 34; Brazil, 57; British Columbia and Alberta, 84; Canada, 81; Canadian provinces, 82; Central America, 62; Chile, 52; Cuba, 67; Dominica, 73; Ecuador, 59; Egypt, 17; Egypt, Upper, 20; Gulf States, 147, 148, 149; Hawaii, 48, 239; Himalayan stations, 32, 37; Jamaica, 66; Indian Empire, 31, 36; Manitoba, 84; Martinique, 73; Mexico, 219; Middle Atlantic United States, 100, 119; New England, 86; New Jersey pine belt, 119; New York State, 109; New Zealand, 44; Newfoundland, 83; Nilgiri Hills, 35; North America, 77; North Carolina pine belt, 135; North Central United States, 157; Nova Scotia, 83; Ontario, 81; Pacific slope United States, 188; Peru, 55; Polynesia, 47; Pullney Hills, 36; Quebec, 82; Rocky Mountain region, 167; Sierra and Coast mountain ranges, 79; South Africa, 24; South America, 50; Southern Atlantic States, 128, 142; Southwestern United States, 152; Steppes of Tartary, 37; St. Kitts, 73; St. Lucia, 73; Tasmania, 42; Trinidad, 72; United States of America, 79, 87; United States of Colombia, 59; Upper Egypt, 20; West India Islands, 65
Coast, Australia, 38; Belize, 64; California, 190; Cape Breton, 82; Chile, 52; Connecticut, 94; Delaware, 107; Florida, 144; Georgia, 142; Hawaii, 239; Louisiana, 149; Maine, 86; Maryland, 108; Massachusetts, 91; Middle Atlantic States, 100; Mississippi, 148; New England, 86; New Hampshire, 90; New Jersey, 103; northern California, 195; Nova Scotia, 83; Oregon, 199; Pacific United States, 188; Rhode Island, 94; South Carolina, 142; southern California, 190; Virginia, 108; Washington, 200
High altitudes, Andes, 51; Argentina, 54; Arizona, 181, 183; Asia, 31; Australia, 40; Bolivia, 55; British Columbia, 84; California, 194, 198; Central America, 62; Colorado, 171; Ecuador, 59; Guatemala, 65; Himalayas, 32, 37; Indian Empire, 32, 34, 35, 37; Montana, 185; Mexico, 220; Nevada, 187; New Mexico, 169; North America, 78; Peru, 55; Rocky Mountains, 167; South Africa, 23, 27; South America, 50; South Dakota, 166; Tennessee, 152; Texas, 150; Tibet, 37; United States of Colombia, 59; Utah, 185; Vermont, 98; Virginia, 132; Wyoming, 184; Yellowstone Park, 184
Inland, Alabama, 152; Australia, 39; Argentine Republic, 54; Arkansas, 154; California, 194, 197; Central America, 62; Connecticut, 99; Florida, 146; Georgia, 139; Honduras, 64; Illinois, 160; Indiana, 159; Kansas, 155; Kentucky, 155; Maryland, 126; Massachusetts, 98; Middle States, 119; Minnesota, 154; Missouri, 153; New England, 95; New Hampshire, 96; New Jersey, 119; New York State, 109; North Carolina, 135; Ohio, 158; Pennsylvania, 122; South Carolina, 138; Tennessee, 153; Texas, 150; Vermont, 98; Virginia, 128; Washington State, 200; West Virginia, 133
Island, Auckland Islands, 47; Bahamas, 71; Barbados, 72; Bermudas, 74; California, 191; Cape Breton, 82; Fiji, 48; Friendly, 48; Isle of Pines, 70; Isles of Shoals, 91; Long Island, 100; Maine, 86; Nantucket, 92; New England States, 86; New Zealand, 43; Newfoundland, 83; of the Pacific, 38, 47; Polynesia, 47; Prince Edward, 84; Sandwich, 48, 223; Society, 47; Tasmania, 42; Thousand Isles, 109; Windward Islands, 72; West Indies, 65

- Lake, Great Lakes**, 160; **Lake Pontchartrain**, 149; **Lake Superior**, 161, 162; lake front, Michigan, 160; lake front, Wisconsin, 162; lakes of New Hampshire, 97; lakes of Washington, 201; **Lake Tahoe**, 187, 198. See *Lake*. **Marine**, Cape May, 106; Lakewood, 120; New York city, 206; Oregon, 199. See *Coast and Island*. Modified, Pennsylvania, 122. **Medium altitude**, Adirondacks, 111; Alberta, 85; Arizona, 180, 181; Asia, 34; Brazil, 58; California, 193, 197; Catskills, 114; Jamaica, 66; Montana, 185; New Hampshire, 96; New Jersey, 121; North America, 78; North Carolina, 136; Pennsylvania, 123; southern New York, 115; Tennessee, 153; Texas, 151; Virginia, 130; West Virginia, 133. **Mineral water**, Arkansas, 154; Arizona, 182; British Columbia, 84; California, 193, 197; Colorado, 176; Cuba, 70; Egypt, 19; Georgia, 139; Idaho, 179; Illinois, 159; Indiana, 159; Kansas, 155; Kentucky, 155; Maryland, 127; Michigan, 161; Mississippi, 148; Missouri, 153; Nebraska, 155; New Mexico, 169; New York, 114, 117; North Carolina, 136; North Dakota, 166; Ohio, 158; Oregon, 199; Pennsylvania, 125; South Africa, 26; South Carolina, 136; South Dakota, 166; Tennessee, 152; Texas, 150; Utah, 186; Virginia, 129; West Virginia, 133; Wisconsin, 162; Wyoming, 184. **Mountain**, Asia, 32; Australia, 40; Central America, 62; North America, 78; South Africa, 23, 26; South America, 51; United States, 79. **Seaside**, California, 190, 196; Cape Breton, 82; Connecticut, 94; Delaware, 107; Florida, 146, 147; Georgia, 143; Long Island, 100; Maine, 86; Maryland, 108; Massachusetts, 91; New Hampshire, 90; New Jersey, 103; New York harbor, 103; New Zealand, 44, 45; North America, 77; Nova Scotia, 83; Oregon, 199; Rhode Island, 94; South Africa, 25; South Carolina, 143; Virginia, 108; Washington, 200. **Sheltered**, Adirondack Lodge, 113; Aiken, 138; Berkshire Hills, 99; Bethlehem (N. H.), 96; Bloemfontein, 28; Brunswick (Ga.), 143; Burke's Garden, 132; Camden (S. C.), 138; Canon City, 177; Castle Creek Hot Springs, 183; Colorado Parks, 179; Delaware Water Gap, 122; El Paso, 151; Fauquier White Sulphur Springs, 130; Gilroy, 197; Glenwood, 178; Gravenhurst, 81; Greenbrier White Sulphur Springs, 133; Harrismith, 29; Hammononton, 120; Lakewood, 120; Idyllwild, 194; Las Cruces, 171; Las Vegas Hot Springs, 169; Morganton, 136; Mexico, 220; Morristown, 121; Napier, 45; Nelson, 45; Redlands, 194; Red Sulphur Springs, 133; Rutland (Mass.), 98; San Gabriel Valley, 192; Santa Barbara, 193; Santa Clara Valley, 195; Saranac, 111; Stowe, 98; Summerville (S. C.), 139; Tannersville, 115; Thomasville, 141; Vineland, 120; Virginia Valley, 128; Washington State, 200; Wernersville, 125; Wynberg, 25; Yellowstone Park, 184. **Heart**, the, 337. **After acute rheumatism**, climatic treatment, 337; **Nauheim treatment**, 337; rest, 337. **After influenza and other infections**, climatic treatment, 337; **Nauheim treatment**, 338; sedative seaside climates, 338; thermal spas, 338. **Dilatation**, anemia and, 277; climatic treatment, 338; dry inland resorts, moderate elevation, 338. **Fatty infiltration**, climatic treatment, 339; climbing exercises, 246, 339. **Functional disorders**, 340; climatic treatment, 340; mineral water resorts, 340; thermal spas, 340; warm salt baths, 340. **Hypertrophy**, climatic treatment, 338. **Imperfect compensation**, climatic treatment, 338; **Nauheim treatment**, 338. **Murmurs**, functional and hemic, 336; significance, 336. **Muscular disease**, climatic treatment, 338. **Palpitation**, 340. **Senile**, 339; climatic treatment, 339. **Valvular disease**, climatic treatment, 338. See *Cardiac*; and *Graves's Disease*. **Heart-disease at Sucre**, 55. **Heberden**, Dr. G. A., 28. **Heidelberg (Germany)**, 255. **Heidelberg (Transvaal)**, 30. **Heiden**, 247, 251. **Helbing**, 281. **Helena**, 185. **Helouan**, 18, 19, 22, 277, 353. **Hemiplegia**, cerebral, 364. **Hemoglobinuria from malarial disease**, 355; paroxysmal, 363; paroxysmal, and Raynaud's disease, 355; paroxysmal, associated with syphilis, 355; paroxysmal, climatic treatment, 355. **Hemoptysis**, waters, Red Sulphur Springs, 133. **Hemorrhoids**, 249, 348; climatic treatment, 348; grape cure, 348. **Hempstead Bay**, 100. **Hendersonville**, 136. **Henlopen**, Cape, 107. **Henryville**, 123. **Hepatic disorders**, deep inspiratory movements, 350; disorders, waters, Topo Chico, 221; torpor, waters, Bedford Springs, 125; waters, Check's Springs, 139; waters, Glenwood, 178. See *Liver, Affections of*, and *Bile-ducts*; *Gall-bladder*; *Gall-stones*; also *Digestive Apparatus, Diseases and Disorders*. **Hickory**, 137. **Highland (N. Y.)**, 115. **Highland Beach**, 103. **Highland Mountains**, 121. **Highland Park Hotel**, 138. **Highland Springs**, 197. **Hill climates**, Indian, classes of patients suited by, 32; stations in Bombay Presidency, 34; stations, Nilgiri, 35; stations, Pullney, 36. **Hill, Dr.**, 172. **Hills**, Berkshire, 79; Black (S. D.), 166; Nilgiri, 35; Pullney, 36; Richmond, 128; Sockoe, 128. **Hilo**, 239. **Himalayan stations**, 32. **Himalayas**, northern declivities of, in Cashmere, 37. **Hindhead**, 298. **Hip-disease**, senile, 289. **Hobart**, 43, 187. **Hokitika**, 44. **Holly Beach**, 103. **Hollywood**, 104. **Holmes**, Oliver Wendell, 103. **Holston Springs**, 133. **Homburg**, 274, 345. **Honda**, 59. **Honduras**, 64. **Honolulu**, 48, 239; disease and mortality in, 238; rainfall at, 235; records of the Weather Bureau, 236; temperature, monthly and yearly averages, 226. **Hospital for Diseases of the Lungs**, Chestnut Hill, 322; East Las Vegas, 169; Roman Catholic, Silver City, 170. See *Tuberculosis, Pulmonary, Sanatoriums*. **Hot Alum Spring (Cal.)**, 108. **Hot Mud Springs (Cal.)**, 198. **Hot Springs (Ark.)**, 137, 154, 280, 370. **Hot Springs (N. C.)**, 137. **Hot Springs (S. D.)**, 166. **Hot Springs (Va.)**, 130, 275, 278, 285, 287, 290, 296, 309, 310, 334, 340, 345, 366, 370, 380. **Hot Springs Junction**, 182. **Hot-air baths**, electric-light forms, 370. See also *Baths*.

Hôtel Dieu, El Paso, 151
 Huachuca, 181
 Huancayo, 51, 55
 Hubbard Springs, 133
 Hudson, 115
 Hudson Hot Springs, 170
 Hudson River, 109, 114, 116; region, 115
 Hudson's Bay Company, 84
 Humber River, 82
 Hunter (N. Y.), 115
 Hunter's Pulaski Alum Springs, 132
 Hunyadi János, 345
 Hurleyville, 116
 Huron, Lake, 81, 160, 161
 Hyde Park (N. Y.), 115
 Hyères, 334
 Hygeia Hotel, Old Point Comfort, 108
 Hyperacidity, general, waters, Cambridge Springs, 125
 Hypochondriac conditions, mineral waters, 246; conditions, open-air exercises, 246; conditions, mountain stations, Nevada, 187
 Hypochondriasis, general management, 366
 Hysteria, 365; and dyspepsia, waters, Bedford Springs, 125; associated with dyspepsia, constipation, and anemia, 365; open-air treatment, 365; with irritable weakness of nervous system, 365
 Hysterical children, management, 365; conditions, mineral waters, 246; conditions, open-air exercises, 246. See also *Nervous System, Diseases*.

I

Idaho, 78, 79, 167, 179
 Idaho City, 179
 Idyllwild, 194, 316, 319
 Illawarra district of New South Wales, 40
 Illimina, 54
 Illinois, 160; chief town, 211
 Illinois Wesleyan University, 218
 Impotence and diminished sexual power, health resorts, 360; following acute infectious diseases, 360. See also *Sexual System, Disorders*.
 Independence Lake, 187
 India, 31; coolest station Darjeeling, 33; seasons influenced by monsoons, 31
 Indian Creek, 133
 Indian Empire, hill climates, 31; other resorts, 36
 Indian Mud Springs (Cal.), 198, 385
 Indian Pass (N. Y.), 113
 Indian River (Fla.), 146
 Indian Spring (Cal.), 198
 Indian Springs (Ga.), 140
 Indian Territory, 184; unavailable as health resort, 184
 Indian Training School, 217
 Indiana, 159
 Indiana University, 218
 Infantile convulsions, deaths from, in Philippines, 49; myxedema, waters, Rothenbrunn, 373; paralysis, tonic treatment, 365
 Inhalation, waters, Richfield Springs, 117
 Inland plains, Australian, 41
 Insane, State Hospital for, Wernersville, 125
 Insomnia, Atlantic City, 106; Bermuda, 76; Block Island, 93; Camden (S. C.), 138; Cape May, 107; Colorado, 179; Egypt, 22; Glen Summit, 173; Kennebunkport, 90; Monterey (Cal.), 196; Mount Desert Island, 87; Nantucket, 93; rest, recreation, 245, 246; Thousand Islands, 110; Vineyard Haven, 93; waters, Richfield Springs, 117. See *Nervous System, Disorders*, and *Sleep, Disorders*.
 Intermediate station, Amalfi, 23; station, Ceres, 26; station, Grahamstown, 26; station, Naples, 23; station, Riviera, 23; station, Sorrento, 23; station, Virginia Beach, 108

Intermittent fevers. See *Fever, Intermittent*.
 Intestinal complaints, climatotherapeutics, 248, 341; complications, Australia unsuitable, 38
 Invalid belt, Colorado, 173
 Invalids, chronic, of weak constitution, Egypt, 22. See *Patients, Classes*.
 Invercargill, 44
 Iodine, 373
 Iodine, 373
 Iowa City, 218
 Iowa College, 218
 Irae, form of paralysis, in Chile and Peru, 53
 Irondale, 347
 Iron Lithia Springs, 132
 Iron Spring, 198
 Iron Ute Manitou Spring, 272
 Irritable weakness, 275
 Irving, Washington, 114
 Island, Block, 92, 93
 Island, Campobello, 86
 Island, Canonicut, 94
 Island, Cape Breton, 82
 Island, Cumberland, 143
 Island, Fire, 102
 Island, Gardiner's, 102
 Island, Green, 111
 Island Heights, 103
 Island, Long, 100
 Island, Luzon, 48
 Island, Mount Desert, 87
 Island, Nantucket, 92
 Island, New Providence, 71
 Island, North, New Zealand, 44
 Island, South, New Zealand, 44
 Island, Prince Edward, 81, 84
 Island resorts of the Pacific, 38
 Island, Round, 109
 Island, Santa Catalina, 191
 Island, Shelter, 102
 Island, Staten, 103
 Island, Stewart, 44
 Island, Sullivan, 142
 Island, Tahiti, 47
 Island, Tasmania, 42
 Island, Tybee, 143
 Island, Wellesley, 109
 Islands, Apostle, 162
 Islands, Auckland, 47
 Islands, Bahama, 71
 Islands, Bermuda, 74
 Islands, British West Indian, 72
 Islands, Channel, 200
 Islands, Channel, of California, 77
 Islands, Fiji, 47
 Islands, Friendly, 48
 Islands, Hawaiian, 48, 223
 Islands, Leeward, 66
 Islands, New Hebrides, 47
 Islands, New Zealand, 43
 Islands off Maine, 86
 Islands, Philippines, 48
 Islands, Sandwich, 47, 48
 Islands, Society, 47
 Islands, Solomon, 47
 Islands, Tatoosh, 109
 Islands, Thousand, 109
 Islands, Tonga, 48
 Islands, tropical, of the Pacific, 47
 Islands, West India, 65
 Islands, Windward, 72
 Isle au Haut, 89
 Isle, Deer, 89
 Isle of Hope, 143
 Isle of Pines, 70
 Isle of Wight, Undercliff, 315
 Isleshoro, 88, 89
 Isles of Shoals, 77, 91, 333
 Islip, 102
 Isthmus of Panama, 63
 Ithaca (N. Y.), 217

J

Jackson (Miss.), 149
 Jackson (N. H.), 97
 Jacksonville, 145
 Jamaica, 66, 77
 Jamaica Bay, 100
 James River, 128
 Jamestown (R. I.), 94
 Japan, 189, 296, 367
 Jauba, 51, 54, 55
 Jaundice, chronic catarrhal, mineral waters for, 349; obstructive, waters, Utah Hot Sulphur Springs, 186; waters, Indian Springs, 140. See also *Digestive Apparatus, Diseases*.
 Jefferson (N. H.), 96
 Jekyll Island, 347
 Johannesburg, 30
 Johns Hopkins University, 126, 215
 Johnson City, 137, 153
 Joint affections, baths, Hot Mud Springs (Cal.), 198; affections, baths, warm, Highland Springs, 198; affections, chronic, baths, Helouan, 19. See also *Gout; Rheumatism; and Articular Affections*.
 Jordan Alum Spring, 131
 Jordan's White Sulphur Springs, 130, 272
 Journey, the, to health resort, 263
 Jupiter Lake, 146

K

Kalk Bay, 25
 Kamloops, 85
 Kane (Pa.), 124, 301, 329
 Kane, Drs., 124
 Kannemeyer, Dr., 27
 Kansas, 155
 Kansas City, 155
 Kaposi's disease, 384
 Karoo, great or central, 23, 24; northern or upper, 23; southern, 23; winter climate, 24
 Katahdin Iron Works, 79
 Katoomba, 41
 Kaaterskill, 115
 Kearsarge Mountain, 97
 Keene (N. H.), 97
 Keene Flats, 113
 Keene Heights, 111, 113
 Keene Valley, 111, 113
 Kehr, Hans, 352
 Kennebec River, 96
 Kennebunk River, 89
 Kennebunkport, 89
 Kentucky, 120, 155
 Kentucky University, 218
 Kephyr, 353. See also *Cures and Health Resorts*.
 Keyes, E. L., 154
 Khamsin winds, Egypt, 18
 Kidneys and bladder, calculi, 358. **Affections, waters**, Carnelian Hot Springs, 198; Greenbrier White Sulphur Springs, 134; Highland Springs, 198. **Chronic diseases**, milk cure, 250. **Functional disturbance**, hot climates, United States of Colombia, 61. See also *Renal; and Urinary Organs, Diseases*.
 Kilauea, volcano, 48
 Kilbourn City, 163
 Kimberly, 28
 Kimberly Sanatorium, 28
 Kingston (Jamaica), 66, 367
 Kingston (N. Y.), 115
 Kissimmee, 309
 Kissingen, 255, 271, 274, 283, 346, 347
 Kittatinny Valley, 121
 Kittery, 90
 Klamath Hot Springs, 198, 269, 363, 370
 Knopf, Dr. S. A., 322
 Koenig, 251
 Kona, 232; climate of, 239

Kotagherri, 36
 Kotagiri, 36
 Kramer (Ind.), 159
 Kreuth, 329
 Kreuznach, 325, 361
 Kumiss, 37. See also *Cures and Health Resorts*.
 Kuro Siwo, 189
 Kurseong, 33
 Kushaqua Lake, 112
 Kussouli, 33

L

La Belle Lake, 163
 La Bourboule, 285, 328
 La Crosse, 162
 La Paz de Ayacucho, 55
 La Pointe, 162
 La Uta, in Peru, 56
 Labrador, 80
 Ladies' Home Sanatorium, 322
 Lake Champlain, 98, 109
 Lake Erie, 80, 81, 116
 Lake Forest, 218
 Lake Forest University, 218
 Lake George, 111, 117
 Lake Hopatcong, 122
 Lake Huron, 81
 Lake, Little Sunapee, 97
 Lake Managua, 64
 Lake Memphramagog, 329
 Lake Michigan, 160, 211
 Lake Mohonk, 301
 Lake Muskoka, 81
 Lake Nicaragua, 64
 Lake Ontario, 81, 109
 Lake Placid, 301
 Lake, Profile, 97
 Lake Rotorua, 46
 Lake St. Clair, 81
 Lake Sunapee, 329
 Lake Superior, 80, 81, 161, 162, 333
 Lake Tahoe, 79, 187, 198,
 Lake Theresa, 109
 Lake Winnibigoshish, 164
 Lake Winnipiseogee, 97, 329
 Lakeland, 309
 Lakes of Maine, 95, 96
 Lakes of New Hampshire, 97
 Lakeside (Ohio), 158
 Lakeside (Wash.), 201
 Lakewood, 77, 119, 120, 268, 278, 287, 294, 319, 376
 Lamalou, 368
 Lampasas Springs, 150
 Lancaster (N. H.), 97
 Landour, 33
 Lanowli, 31, 34
 Laquer, Dr. Benno, 252
 Laryngeal cases, Castine, unsuitable, 88; complications, Australia, unsuitable, 38; irritation, Maritzburg, 30; tuberculosis, 306; tuberculosis, in Peru, 56. See also *Respiratory Organs, Diseases; and Tuberculosis*.
 Las Cruces, 78, 171
 Las Vegas, 169, 269, 277, 285
 Las Vegas Hot Springs, 169, 351
 Latta Sanatorium, 322
 Launceston, 43
 Laurentian Sanatorium, 82, 321
 Laurentians, 82
 Lavalette, 103
 Lawrence (Kan.), 218
 Lebanon (N. H.), 97
 Lebert, 251, 252
 Lee (Mass.), 99
 Leech Lake, 164
 Leeward Islands, 66
 Lehigh University, 217
 Leland Stanford, Jr., University, 218

- Lemoenfontein Hotel, 27
 Lennig, 103
 Lenoir, 137
 Lenox, 99
 Leon, Dr. G. A., 271
 Leprosy among Scandinavians in Minnesota, 164; in Central America, 63; in Mexico, 219
 Le Roy, 184
 Les Avants, 298, 334, 369
 Le Vernet, 312
 Lesser Antilles, 72
 Leukorrhea, 362; waters, Rockbridge Alum Springs, 131; waters, Sweet Chalybeate Springs, 131; waters, Yellow Sulphur Springs, 132. See also *Sexual System, Diseases*.
 Levico, 272
 Lewes (Del.), 107
 Lexington (Ky.), 218
 Lexington (Va.), 218
 Leysin, 257
 Liberty, 118, 116
 Liberty Falls, 116
 Liccaga, Dr., 220
 Lick Observatory, 196
 Life, various periods, influence of climate on, 299. See *Age; Periods of Life; Senility*, etc.
 Lima, 55
 Lineville Mineral Springs, 347
 Linville, 137
 Lippspringe, 313
 Litchfield, 99
 Lithia water baths, Mudlavia, 159
 Little Boar's Head, 91
 Little Neck, 102
 Little Peconic Bay, 100
 Little Sunapee Lake, 97
 Littleton, 97
 Liver, abscess, in Peru, 56; and bile-ducts, affections of, 348; affections, waters, Cambridge Springs, 125; affections, waters, Carnelian Hot Springs, 108; affections, waters, Greenbrier White Sulphur Springs, 133; affections, waters, Pluto Spring, 159; cirrhosis, 349; congestion and enlargement, climatic treatment, 348; engorgement, waters, Saratoga, 114. *Functional disorders*, affections associated with, 349; climatic treatment, 349; hot climates, United States of Colombia, 61. See also *Digestive Apparatus, Diseases*.
 Llandrindod, 274, 283, 296, 345, 380
 Llewellyn Park, 121
 Locomotor ataxia, 368; mechanotherapy, 247
 Loèche-les-Bains, 384
 London, 207, 208, 301
 Londonderry Lithia, 356
 Long Beach (Cal.), 193
 Long Beach (L. I.), 102
 Long Beach City, 103
 Long Branch, 103, 104
 Long Island, 77, 100, 101, 102, 301
 Long Island City, 204
 Long Island Sound, 77, 95, 100
 Long Lake, 111
 Longport, 103
 Long's Peak, 178
 Lookout Mountain, 153
 Loomis, Dr. Alfred, 321
 Loomis Sanitarium, 258
 Loon Lake, 111
 Los Angeles, 188, 190, 192
 Los Gatos, 196
 Louisiana, 78, 148, 149; chief town, 213
 Louisville, 156
 Low altitude resorts of North America, 77, 78
 Low Moor, 103
 Lowe Mountain, 193
 Lower California, Mexico, 190
 Lower Pecos Valley, 78
 Lower St. Regis Lake, 112
 Luchon, 312
 Ludlow Grove, 159
 Lukatschowitz, 358
 Lumbago, thermal waters, Caledon, 26
 Lung affections, early stages, Camden (S. C.), 138; affections, tuberculous, Cape May not beneficial, 107; waters, Check's Springs, 139; winter climate, Cleveland unsuitable, 158. See also *Respiratory Organs, Diseases*; and *Tuberculosis, Pulmonary*.
 Lupus erythematosus, 384; in Peru, 56; vulgaris, 383. See also *Skin, Affections*.
 Luxor, 17, 18, 20
 Luzon, 48
 Lynchburg, 128, 131
- M
- MacCormack, Dr. Henry, 257
 Macedon, Lower, 41
 Macedon, Upper, 41
 Machias, 87
 Mackinac Island, 160
 Mackinaw, 160
 Maclaren, 311
 Macon, 140
 Madeira, 305, 327
 Madison, 218
 Madras Presidency, 35
 Magnesia Spring, Kane Co. (Ill.), 160
 Mahabeshwar, 31, 34
 Maine, 77, 78; coast, 86; inland, 95
 Malaga, 119
 Malaria, baths, Greenbrier White Sulphur Springs, 134; convalescence from, Lake Pontchartrain, 148; death from, at Naos, 63; effects of, Lake Superior, 162; endemic in Arkansas, 154; in Bolivia, 55; in Central America, 63; in coast region of Honduras, 64; in eastern Maryland, 126; in Gulf coast region, 298; in Havana, 69; in Louisiana, 149; in James and Potomac River regions, 128; in Nicaragua, 64; in northern shores of Lake Erie, 81; in Philippines, 49; hepatic disorders resulting from, 349; immunity, Asheville, 136; Atlantic City, 105; Bermuda Islands, 75; Boerne, 150; Camden (S. C.), 138; Canon City, 177; Citronelle, 152; El Paso, 151; Fiji Islands, 48; Guatemala City, 65; Hawaii, 240; Hudson Valley, 109; in regions drained by St. Lawrence, 81; Lake Huron, 81; Lake Ontario, 81; Lake Superior, 81; Marquette, 161; Northwest and Pacific Provinces, Canada, 81; Quebec, 81; Rangeley Lakes, 96; St. Paul, 164; Toronto, 82; Winnipeg, 84; Winter Park, 147
 Malarial affections, Hawaii, 240; affections, Morganton, 137; and tropic anemia, high altitude resorts, 298; and tropic anemia, simple thermal spas in mountain valleys, 298; cachexia, 298. Chronic, climatic treatment, 297; from long residence in hot climates, 297; Glen Summit, 123; mountain stations in United States, 298; seaside resorts, 298; simple thermal spas, 298; waters, 297. *Fever*. See *Fever, Malarial*.
 Malta fever. See *Fever, Malta*.
 Managua, 64; Lake of, 64
 Manasquan, 103
 Mandeville, 67
 Manhattan (Kan.), 155
 Manhattan (N. Y.), 100, 103
 Manhattan Beach, 102
 Manhattan Island, 204
 Manila, 48
 Manistee, 161
 Manitoba, 80, 81, 84
 Manitou, 79, 334
 Manitou Park, 179
 Manly, 40
 Mansfield, 217.

- Mantoloking, 103, 104
 Maplewood, 96, 301, 333
 Mardela Springs, 127
 Maricopa, 179
 Marie, Pierre, 290
 Marienbad, 292, 346, 380
 Marietta, 140
 Marinao, 70
 Marion (Miss.), 148
 Maritzburg, 30
 Marlborough, 115
 Marlioz, 328
 Marquette, 83, 161
 Marri, 33
 Martha's Vineyard, 77, 91, 92
 Martinique, 73, 74
 Maryland, 76, 107, 108, 120, 126, 127
 Masconia Lake, 97
 Massachusetts, 77, 78, 91, 98; chief town, 203
 Massachusetts Agricultural College, 216
 Massachusetts Bay, 91
 Massachusetts Institute of Technology, 215
 Massachusetts State Hospital for Consumptives, 321
 Massanetta, 272
 Massanetta Springs, 130
 Matheran, 34
 Mauna Kea, 224; snow on, 232
 Mauna Loa, 224; snow on, 232
 May, Dr. Page, 19
 Mayer, J., 351
 Mayfield, 160
 McDonald Lake, 185
 McKinney's, 187
 Meadville, 124
 Mechanotherapeutics, 246
 Medford, 216
 Medical Lake, 201
 Medical supervision essential at health resorts, 21, 246, 254, 255; in tuberculosis, 304, 312
 Mediterranean trip, cold weather during, 254
 Medium altitude resorts. *See Health Resorts, Medium Altitude.*
 Melancholia, Kennebunkport, 90; Lake Superior, 162; southeastern coast of Massachusetts, 92. *See also Mental Depression.*
 Mena House, 353
 Mena House Hotel, 19
 Mendip Hills, 258
 Mendoza, 34
 Ménière's symptoms. *See Ear.*
 Menopause, disorders, 363. *See also Climacteric; and Periods of Life.*
 Menorrhagia, brine baths, 361; mineral waters, 361. *See also Sexual System, Diseases.*
 Menstrual disorders, waters, Fauquier White Sulphur Springs, 130; disorders, waters, Nye Lithia Springs, 132
 Mental and nervous disorders due to dyspepsia, 344; cases, Milwaukee Sanatorium, Wauwatosa, 164; depression, 366; depression, Egypt, 22; depression, Lake Superior, 162 (*see also Depression, Mental; and Nervous Disorders*); fatigue, Mount Desert Island, 87; fatigue, Newfoundland, 84; fatigue, southeastern coast of Massachusetts, 92. *See Rest and Recreation.*
 Mentone, 305
 Meran, 246, 252, 308, 339
 Meridian, 149
 Mesilla, 78
 Mesilla Valley, 171
 Metabolism, some disorders of, 201. *See also Diabetes; Glycosuria; Gout; Obesity, etc.*
 Metallic poisoning, baths Beck's Hot Sulphur Springs, 186. *See also Poisoning.*
 Metritis, chronic, 362
 Mexico, 78, 219, 315; central plateau, 220; City of, 219; chlorosis prevalent, 219; cold zone, 219; gulf of, 142, 152; leprosy in, 219; malaria prevalent, 219; smallpox in, 219; temperate zone, 219; towns of the plateau, 39, 220; warm zone, 219; warm zone, tuberculosis prevalent, 219; yellow fever prevalent, 219
 Miami, 61, 147, 325
 Michigan, 78, 80, 83, 160, 162
 Michigan Lake, 160, 162, 163
 Middle Park, 178
 Middletown, 217
 Migraine, treatment, climatic, 377; treatment, spas, 377. *See also Headache and Nervous System, Diseases.*
 Milk in pulmonary tuberculosis, 251; in renal affections, 251; sour, 250; and whey cures, 248; health resorts for, 251. Cures, 249; climatic health resorts for, 251; for bronchitis and emphysematous patients, 330; for dyspeptic conditions, 250; in chronic diseases of the kidneys and urinary organs, 250; in gouty affections, 250
 Millboro, 131
 Milton, 115
 Milwaukee Sanatorium, Wauwatosa, 164
 Mindiana, 73
 Mineral spring resort in Cuba, 70; in Maine, 95; in New Jersey, 121; in Nevada, 187; in Oregon, 199; in Texas, 150; in Transvaal, 20; in Washington, 201; resorts in Arkansas, 154; in Arizona, 182; in Colorado, 177, 178; in Georgia, 140, 141; in Indiana, 159; in Kentucky, 156; in Maryland, 127; in Mexico, 221; in Michigan, 161; in New Mexico, 160, 170; in New York, 113, 117; in North Carolina, 137; in Pennsylvania, 123, 124, 125; in Virginia, 129; in West Virginia, 135; in Wisconsin, 163; in United States of Colombia, 61; in Utah, 186; springs in Alleghany and Blue Ridge Mountains, 129; in British Columbia, 84; in California, 197; in Georgia, 139; in Illinois, 160; in Idaho, 179; in Kansas, 155; in Louisiana, 149; in Mississippi, 148; in Missouri, 153; in New Zealand, 45; in North Dakota, 166; in Ohio, 158; in South Carolina, 137; in South Dakota, 166; in West Virginia, 133; in Yellowstone Park, 184; water resorts, warm seasons, 253; resorts for whey and kumiss, 251; waters sanatorium, Caledon, 26. *See Health Resorts, Mineral Water; also Waters.*
 Mi-ni-yan Springs, 160
 Minneapolis, 165, 218
 Minnequa, 124
 Minnesota, 78, 83, 164
 Minnesota National Park, 164
 Minnesota University, 218
 Minnetonka Lake, 165
 Minnewaska, 201
 Mississippi, 78, 148, 149, 162, 165
 Missouri, 153; chief town, 212
 Missouri River, 153, 155
 Mitchell House, 141
 Mitchell S. Weir, 368, 377
 Mitral disease, Nauheim treatment, 338; stenosis, Nauheim treatment, 338. *See also Heart.*
 Mobile, 152
 Moebius, P. J., 343, 350
 Moisture, absence of, influence of, on bodily functions, Arizona, 180
 Mojave Desert, 78, 195
 Mompox, 59
 Monmouth Beach, 103
 Monroe Corners, 123
 Monrovia, 193
 Monsoon, 37; moist, 37; southwest, 35; warm, moisture-laden southwest, of India, 31
 Montana, 78, 79, 167, 185
 Montana Experiment Station, 185
 Montana Rockies, 185
 Montauk, 101
 Montauk Point, 100

- Montclair, 121
 Mont-Dore, 298, 335
 Monterey (Cal.), 196, 353
 Monterey (Mex.), 78, 221
 Monterey Bay, 196
 Montezuma Hotel, 169
 Montgomery White Sulphur Springs, 132
 Monticello, 116
 Montreal, 80, 81, 83, 200
 Montreux, 251, 252, 308; as grape cure resort, 251
 Moor baths, 361. See also *Baths*.
 Moore, Surgeon A. M., U. S. N., 71
 Moosehead Lake, 96, 333
 Morganton, 136, 137
 Moriches, 102
 Mormaco, sultry debilitating period, Rio de Janeiro, 57
 Mormon Temple, 186
 Morne Diablotin, 73
 Morristown, 121
 Mosquitos, immunity from, eastern Washington, 200
 Mount Abu, 35
 Mount Agassiz, 96, 181
 Mount Clemens, 161, 349
 Mount Colden, 112
 Mount Desert, 77, 79, 86
 Mount Desert Island, 87
 Mount Field, 85
 Mount Hamilton, 196
 Mount Haystack, 112
 Mount Hillaby, 72
 Mount Holyoke College, 217
 Mount Humboldt, 181
 Mount Humphrey, 181
 Mount Katahdin, 96
 Mount Kineo, 78, 79, 96, 333, 378
 Mount Kosciuszko, 40
 Mount Lowe, 193
 Mount Macedon, 41
 Mount Mansfield, 98
 Mount Marcy, 112, 113
 Mount McIntire, 112
 Mount Paraiso Hot Soda Springs, 348
 Mount Pocono, 123
 Mount Seward, 112
 Mount Stephen, 85
 Mount Victoria, 41
 Mount Whiteface, 112
 Mount Whitney, 189
 Mount Wilson, 193
 Mountain, Croydon, 98; Green, 87; Kearsarge, 97; Lookout, 153; Paris, 139; Pocono, 123; Roan (Tenn.), 152, 153; Saddle, 99; Sandstone, 141; San Jacinto, 194. *Fever*, 167; in Rocky Mountain region, 167, 168. *Resorts*, Andean, 51; Asian, 31; Australian, 40; Central America, 62; Jamaican, 66; North American, 78; South African, 24; *Sickness*, Argentina, 54. *Spa*, Bedford Springs, 125. *Spas*, Californian, 197; Virginian, 129; West Virginian, 133. *Stations*, Canadian, 82, 85; of United States, 79. See *Health Resorts*, *High Altitudes*, and *Health Resorts*, *Medium Altitudes*.
 Mountain Lake, 79, 132
 Mountains, Adirondacks, 79, 98, 110; Alleghany (Md.), 127; Alleghany (Pa.), 79, 122, 125; Alleghany (Va.), 129; Appalachian, 128, 298; Australian, 40; Black (N. C.), 136; Blue (Jamaica), 66; Blue (New South Wales), 40; Blue Ridge (N. C.), 136; Blue Ridge (Pa.), 121, 122, 125; Blue Ridge (S. C.), 139; Blue Ridge (Va.), 128, 129, 130; Bradshaw, 183; Cascade, 199, 200, 201; Catskill, 79, 109, 114; Coast Range, 78, 79, 85, 190, 192, 197; Cuyamaca, 191; Gold, 85; Green, 79; Highland, 121; Nieuwveldt, 27; Orange, 121; Ozark (Ark.), 79, 154; Ozark (Mo.), 153; Rocky, 84, 110, 138, 151, 155, 167; Sacramento, 171; San Jacinto, 191, 194; Santa Cruz, 67; Shawangunk (N. J.), 121; Shawangunk (N. Y.), 79, 116; Sierra Madre, 192; Sierra Nevada, 78, 79, 190; Tahitian, 47; White, 79, 90, 96. *Volcanic*, of Hawaii, 224
 Myocardial degeneration, climatic treatment, 338. See also *Heart*.
 Mystic, 95
 Mystic River, 95
 Myxedema and cretinism, 373; infantile, waters, Rothenbunnen, 373; thyroid treatment, 373. See also *Nervous System*, *Diseases*.
 Mucous membranes, atonic affections, waters, Rockbridge Alum Springs, 131; membranes, catarrhal affections, waters, Rockbridge Alum Springs, 131; membranes, waters, sedative effects, Red Sulphur Springs, 133; membranes, weak, 343
 Mud-baths, Hot Mud Springs, 197; Mudlavia, 159; Las Vegas Hot Springs, 169. See *Baths*.
 Mudlavia, 159, 362
 Mumuku, 232
 Munich, 301
 Muriated waters. See *Waters*.
 Murray River, 41
 Muskoka, Lake, 78, 81
 Muskoka Cottage Sanatorium, 320
 Mussoorie, 31, 33
- N**
- Nagawicka Lake, 163
 Naina Tal, 33
 Nantucket, 77, 91, 92, 93
 Nantucket Island, 92
 Nantucket Sound, 91
 Naos, 63
 Napa City, 197
 Napa Soda Springs, 197, 345, 385
 Napa Valley, 195
 Napier, 45
 Naples, 23, 301
 Narcolepsy, 379
 Narragansett, 95
 Narragansett Bay, 77, 94
 Narragansett Pier, 94
 Nasal polypi, 327
 Nassau, 71, 147, 325
 Natatorium at Helena, 185
 National Jewish Hospital for Consumptives, 322
 Natural Bridge, 131
 Nauheim, 247, 269, 287, 332, 337, 338, 361
 Navesink Beach, 103
 Nebraska, 155
 Neenah, 163
 Neisser, 280
 Nelson, 45
 Nenndorf, 274
 Nephritis, Avalon (Cal.), 192; Bermuda, 76; Cumberland Island, 143; Lake Pontchartrain, 148; Ojai Valley, 195; Santa Barbara, 193; waters, Farmville Lithia Springs, 129; waters, Napa Soda Springs, 197. *Acute*, convalescence from, Egypt, 22; *catarrhal*, waters, Wilhoit Springs, 199. *Chronic*, climatic treatment, 353; milk cure, 353; resorts, Virginia Beach, 108; simple thermal spas, 353; waters, Catoosa Springs, 140; waters, table, St. Clair Springs, 161; *interstitial*, 355
 Nervous affections, 364; affections, Milwaukee Sanatorium, 164; Minneapolis, 165; Phoenix, 182; St. Paul, 165; United States of Colombia, 61; *chronic*, Monterey (Cal.), 196; *convalescence from*, Tarpon Springs, 147; *functional*, Block Island, 93; Nantucket, 93; Vineyard Haven, 93; *functional or organic*, with heart symptoms, Portland (Ore.), 199. *Depression*, Newfoundland, 84. *Dyspepsia*, 345. *Patients*, Colorado

- unsuitable for, 172. **System, diseases and disorders, 364.** Asthma, spasmodic, 334. Backache, mineral water health resorts, 371. **Basedow's disease.** See *Graves's Disease.* Brachialgia, 369. Diabetes insipidus, climatic and spa treatment, 373; mineral waters, 374. Epilepsy, sanatorium treatment, 365. Functional nervous disorders, sea air and sea bathing, 365. General paralysis, voyages and traveling counterindicated, 368. Goiter, exophthalmic. See *Graves's Disease.* Graves's disease, baths, gaseous thermal muriated, Nauheim, 372; hydrotherapeutic measures, 372; massage, 372; Schott's resistance exercises, 372; simple thermal spas, 372. Headaches, neurotic, simple thermal spas, 378; recurrent or chronic, climatic treatment, 374; spa treatment, 374. See also *Headaches.* Hypochondriasis, health resorts for, 366; traveling for, 366. Hysteria, country localities for treatment, 365; with irritable weakness, 365. Infantile paralysis, lingering effects, brine baths, 365. Insomnia, chronic, 378 (see also *Sleep Disorders*); due to dyspepsia, intestinal catarrh, and constipation, 379; exciting causes, 379. Mental depression, climatic treatment, 366; sea voyage, 367. See also *Rest and Recreation.* Myxedema, climatic treatment, 373; infantile, mineral waters, Rothenbrunn, 373. Neuralgia, facial, chalybeate and arsenical spas, 371; climatic treatment, 371; trigeminal, 370. See also *Neuritis and Neuralgias.* Neurasthenia, climatic treatment, 367; open-air cure, 368; Weir Mitchell treatment, 368. See also *Neurasthenia.* Neuritis and neuralgias, baths, 369; hot-air, 370; douches and massage, 369; douches, Scotch, 370; health resorts, 369, 370; hot-air baths, electric-light forms, 370; massage, douche-massage, and forcible douches, 370; radiant heat baths, 370; simple thermal waters, 370; vapor baths, 370; peripheral, following infectious diseases, baths, douches, and massage, 369; following infectious diseases, health resorts, 369. Organic affections, due to syphilitic changes, 365; hemiplegia and paraplegia, simple thermal baths, 364; sulphated alkaline waters, preventive value, 364. Sciatica, 369; with gouty tendency, climatic treatment, 370. Sleep, disorders, 378; causes, 378, 379; defective, altitudes, 378; hydrotherapy, 378; long voyages, 378; simple thermal spas, 378; excessive, massage and Swedish gymnastics, 380; open-air exercise, 379; spa treatment, 380. **Tabs dorsalis**, antisyphilitic measures, 368; baths, hot, counterindicated, 368; baths, thermal, 368; climatic health resorts, 369; exercise, methodic muscular, of Dr. Frenkel, 369; yachting, 368. Tic douloureux. See *Neuralgia, Trigeminal.*
- Nervously excitable cases, Bermuda, 76; Hawaii, 241; Colorado unsuitable, 172. Neuenahr, 255, 295. Neuralgia at Sucre, 55; Block Island, 94; Nantucket, 94; Tucson, 183; Vineyard Haven, 94; waters, Agua Caliente, 182; waters, Highland Springs, 198; waters, Mount Clemens, 161; waters, Sweet Chalybeate Springs, 131. **Facial**, climatic treatment, 371. Of the supraorbital branch of the trigeminal nerve associated with chronic malaria, climatic and spa treatment, 371. Trigeminal, 370. See *Neuritis and Neuralgias*; also *Nervous System, Disorders.*
- Neuralgic cases, Bermuda unsuitable, 76; conditions, thermal baths, Rotorua, 46. Neurasthenia, climatic treatment, 367. Open-air cure, 368; rest and recreation, 245, 246; Weir Mitchell treatment, 368. Resorts, Bermuda, 76; Block Island, 94; Cape Breton, 82; Cape May, 107; Canadian Rockies, 85; Glen Summit, 123; Kennebunkport, 90; Long Island resorts, 102; Monterey (Cal.), 196; Mount Desert Island, 87; mountain stations of Nevada, 187; Nantucket, 94; Vineyard Haven, 94; Virginia Beach, 108. **Waters**, Fauquier White Sulphur Springs, 130. See also *Nervous System, Diseases.*
- Neuritis and neuralgias, 369; and neuralgias, douche-massage, 370; and neuralgias, douches, hot and alternating, 370; and neuralgias, health resorts, 370; and neuralgias, thermal waters, 370; multiple, cause of death in Philippines, 49; peripheral, following infectious diseases, health resorts, 369; sciatic, a symptom of diabetes, 370. See also *Nervous System, Diseases.*
- Neurotic asthma, 334; headaches, simple thermal spas, 378. Nevada, 79, 187, 198. Neversink, 116. New Almaden Spring, 272. New Bedford, 91. New Brunswick, 217. New Canaan, 99. New Dorp, 103. New England, 80, 85, 86, 98, 101, 122, 136. New Hamburg, 115. New Hampshire, 77, 78, 86, 90, 96, 97. New Haven, 95, 217. New Haven Harbor, 95. New Hebrides, 47. New Jersey, 77, 103, 119, 207. New London, 94, 95. New Mexico, 78, 150, 167, 169, 180, 193. New Milford, 99. New Orleans, 149, 213, 367; cholera at, 214; ice and snow at, 213; malaria at, 214; schools of, 215; yellow fever at, 214. New Orleans University, 215. New Providence, 147. New Providence Island, 71. New York City, 92, 99, 100, 101, 102, 115, 174, 175, 204, 208, 214, 259; schools, 215; suburbs, 206. New York Harbor, 103. New York State, 78, 80, 103, 109, 121, 136; chief town, 204; health resorts, 109. New York University, 215. New Zealand, 43. Newark, 121. Newburg, 109, 115. Newcastle (Jamaica), 66. Newcastle (Me.), 90. Newfoundland Lake, 97. Newfoundland, 77, 83, 188. Newport (Ore.), 199. Newport (R. I.), 94, 104. Newton, 204. Niagara Falls, 117. Niantic, 94. Nicaragua, 64; diseases endemic in, 64; Lake of, 64. Nieuwveldt Mountains, 27. Nile voyage, 17, 20, 22. Nilgiri Hills, 35. Nogales, 181. Noorden, Carl von, 251, 354. Nordhoff, 194. Norfolk (Va.), 108, 128. Norfolk (Eng.), coast, 258. North Carolina, 78, 135, 153. North Dakota, 78, 83, 166. North Hampton (N. H.), 91. North Island, 44. North Pacific current, 189. North Park, 178. North wind at Cairo, 18.

North Woodstock, 301
 Northampton (Mass.), 216
 Northeast Harbor, 87
 Northwest Territory, 80
 Northwestern University, 216
 Norwich (Conn.), 95
 Nose, affections, waters, Proserpine Spring, 159. See also *Respiratory Organs, Diseases*.
 Nottage, Captain, 240
 Nova Scotia, 77, 83, 333; immunity of, from hay-fever, 83; unsuitable for invalids, 83
 Nueva Gerona, 70
 Nye Lithia Springs, 132
 Nynee Tal, 33

O

Oak Orchard Springs, 272
 Oakland, 196
 Oberlin, 218
 Oberlin College, 218
 Obersalzbrunn, 266, 330
 Obesity, baths, thermal effervescent, 292; climatic treatment, 291; diet, 291; grape cure for, 252; mud-baths, Mudlavia, for reduction, 159; waters, Marienbad, 292; waters, Pluto Spring, 159
 Ocala, 309
 Ocean City (Md.), 108
 Ocean City (N. J.), 103
 Ocean currents, Hawaii, 228-230; current, Kuro Siwo, 189; currents, influence of, on climate of California, 189; sanatoriums, 312; voyages. See *Voyages*.
 Ocean Grove, 103
 Oconomowoc, 163
 Oconomowoc Lake, 163
 Oertel, Professor M. J., 246, 339
 Oeynhausen, 247, 269, 364
 Ogdensburg (Thousand Islands), 110
 Ogunquit, 90
 Ohio, 157
 Ohio River, 156, 157
 Ohio Wesleyan University, 218
 Ojai Valley, 78, 194, 195
 Ojo Caliente, 272
 Ojo del Toro, 67
 Oklahoma, 184
 Old age and premature old age, 300; persons, prematurely, Egypt, 22; persons, unsuitability of milk cure for, 250. See also *Age and Periods of Life*.
 Old Fort, 183
 Old Point Comfort, 108, 270, 294
 Old Sweet Springs, 133, 347
 Olympia, 78, 188, 200
 Omaha, 155
 Omoa, 64
 Oneida Lake, 118
 Ontario, 78, 80, 81
 Ontario, Lake, 81, 101, 109
 Ootacamund, 31, 35
 Open-air exercise, 246, 344; life, 37, 265, 314, 320; life, Australian plains, 41; life, Indian Territory, 184; life, Nelson, 45; life, Oklahoma, 184; life, country, South African climates, 39; recreation, 246; rest, 257, 258, 265; treatment, 257, 304; treatment, Colorado Springs, 177; treatment, Egypt, 23; treatment, opportunities for, 265. See also *Out-door*, and *Out-of-door life*.
 Oracle, 183
 Oranges, The (N. J.), 121
 Orange Mountains, 121
 Orange River Colony, 28
 Oregon, 78, 199
 Orkney Springs, 130
 Orlando, 146, 309
 Oroya fever. See *Fever, Oroya*.

Ortley, 103
 Oshkosh, 163
 Ossipee Lake, 97
 Otsego Lake, 118
 Otterburn Lithia Springs, 129
 Otterburn Magnesia Springs, 129
 Ouray Springs, 345
 Out-door exercise, 246; exercise, Huancayo, 55; exercise, Jauja, 55
 Out-of-door life, Aiken, 138; life, Avalon (Cal.), 192; life, Bermuda, 75; life, Boerne, 150; life, Canon City, 17; life, Colorado, 172; life, Fauquier White Sulphur Springs, 130; life, Florida, 144; life, Hammonton, 120; life, Idyllwild, 194; life, Kennebunkport, 90; life, Lake Minnetonka, 165; life, Lakewood, 120; life, Liberty Heights, 116; life, Minnesota, park region, 165; life, Monterey (Cal.), 196; life, Pasadena, 192; life, Rangeley Lake region, 96; life, Sao Paulo, 59; life, Silver City, 170; life, Vineland, 120
 Overworked, the, Cape Breton, 82; Castine, 88; Hawaii, 241; Kennebunkport, 90; Lake Minnetonka, 165; ocean voyage, 344; southeastern coast of Massachusetts, 92; summer voyage to Newfoundland or Nova Scotia, 83; Virginia Beach, 108. See *Depression*; *Exhaustion, Mental*; *Neurasthenia*; *Rest and Recreation*.
 Owasso, 272
 Oxaluria, 355; due to overwork, sea-voyages, 357; with dyspepsia, mineral water health resorts, 357
 Oyster Bay, 102
 Ozark Mountains (Ark.), 79, 154
 Ozark Mountains (Mo.), 153

P

Pachmari, 35
 Pacific Coast of the United States, 188
 Pacific, island resorts, 38
 Pacific Ocean, 190, 192, 194; tropic islands, 47
 Palenville, 113
 Palm Beach, 147, 270
 Palmyra Springs, 163
 Palo Alto (Cal.), 190, 218
 Pamlico Sound, 135
 Panama, 63; Isthmus of, 63
 Para, 58
 Paradise (Pa.), 122
 Paralysis, general, 368; infantile, lingering, tonic treatment, brine baths and sea air, 365
 Parametritis and perimetritis, lingering effects, 362
 Parana, 54
 Paraplegia, 364; baths, simple thermal, 364; baths, weak thermal muriated, Bourbon-l'Archambault, 364; due to myelitis, mineral water health resorts, Oeynhausen, 364
 Paris, 301
 Paris Mountain, 130
 Park, Canadian National, 84; Fairmount, 208; region of Minnesota, 164; Yellowstone National, 184
 Parks of Colorado, 178; of New York city, 205
 Paroxysmal hemoglobinuria, 263
 Parramatta, 40
 Pasadena, 78, 192
 Pass Christian, 148
 Passaconaway, 90
 Passaic Lake, 119
 Passamaquoddy Bay, 86
 Pasteur Sanatorium, 321
 Patchogue, 102
 Patient, constitution of, in selection of health resorts, 261, 304, 395; inclination of, in selection of health resort, 265
 Patients, classes not suited by Andes, 51;

- Arizona, 180, 181; Australia, 38; Bahamas, 72; Bermuda, 75; Castine, 88; Cloudland, 152; Colorado, 172, 173, 174; Colorado ranch life, 179; Egypt, 23; Florida, 144; Hawaii, 240; Lo. Angeles, 192; Mexico, 220; Minnesota, 165
- Patients, classes not suited by grape cure, 252; classes not suited by milk cure, 250, 251; classes not suited by sea-air and sea-bathing, 253, 208, 242; classes not suited by waters, Bedford (Pa.), 125; Glenwood, 178**
- Patients, classes suited by Aiken, 138; Andes, 52; Arizona, 180, 181; Assouan, 18; Atlantic City, 106; Australia, 38, 39; Bahamas, 72; Berkshire Hills, 99; Bermuda, 76; Block Island, 93; Cairo, 18; Cape May, 107; Colombian resorts, 60, 61; Colorado, 172, 173; Colorado ranch life, 179; Florida, 144; Greenbrier White Sulphur Springs, 133; Hawaii, 240; Helouan, 18; hill stations, India, 32; Hot Springs (Ark.), 154; Hot Springs (Va.), 130; Lake Tahoe, 187; Long Island resorts, 102; Los Angeles, 192; Marquette, 161; Mexico, 220; Minnesota, 165; Montana, 185; Nantucket, 93; New Jersey Pine Belt, 120; Newfoundland, 84; Portland (Ore.), 199; Richmond, 129; San Gabriel Valley, 193; Santa Barbara, 193; Santa Clara Valley, 190; Sao Paulo, 59; South Africa, 24; Texas, 149; Vineland, 120; Vineyard Haven, 93; Virginia, 128; West Indies, 65; White Mountain region, 97; Wisconsin, 162**
- Patients, classes suited by open-air exercise, 246, 265; open-air rest, 258, 265**
- Patients, consumptives, classes of, in relation to climatic treatment, 304, 305, 314, 317; classes needing invigoration, 316, 319; classes needing protection, 316, 317, 318, 319**
- Patients, delicate, Aiken, 138; Avalon, 191; Monterey (Cal.), 196; Greenbrier White Sulphur Springs, 133; Hawaii, 241; various American resorts, 290; Virginia Beach, 108; ill effects of cold weather, 263; ill effects of fasting, 262; ill effects of fatigue, 262; ill effects of overfeeding, 262; selection of rooms for, 266; traveling arrangements for, 264; unsuitability of Andes, 52; unsuitability of Arizona, 180; unsuitability of Texas, 149; of nervous constitution, excitement harmful, 261; of torpid constitution, active treatment, necessary, 262; seriously ill, Australian mountains unsuited, 40; Cairo unsuited, 18; Mexico unsuited, 220; Nile voyage unsuited, 20; Texas unsuited, 149; Yuma unsuited, 182. Strong, good effects of cold, 263; good effects of fasting, 262; good effects of purgatives, 262**
- Patients, supervision of, at health resorts, 21, 246, 248, 254, 255**
- Paul, 305, 331**
- Paul Smith's, 111, 112, 331**
- Peale, Dr. A. C., 197**
- Peekskill, 115**
- Pelvic organs, functional disorders, waters, Glenn Springs, 139; waters, Mardela Springs, 127. See also Sexual System, Diseases.**
- Penacook, Lake, 97**
- Penas Hill, 54**
- Peninsula of Yucatan, 64**
- Pennsylvania, 78, 121, 122, 160, 190; chief town of, 207**
- Pennsylvania Academy of the Fine Arts, 215**
- Pennsylvania School of Industrial Art, 215**
- Pennsylvania State Normal College, 217**
- Penobscot Bay, 88, 89**
- Penobscot River, 96**
- Penzance, 324**
- Pericarditis, 299**
- Periods of treatment, 299**
- 299; in women, spa treatment, 299. Old Age and premature old age, 300; climates suitable for, 300, 301; sea voyages, 301; towns, interesting, residence in, 301. Premature senility, 302. See also Age; Children; Young; Senility, etc.**
- Perry Springs, 160**
- Peru, 53, 55; health resorts of high altitudes, 50, 51, 55**
- Peruvian coast-line, rainlessness, 50**
- Peterboro, 80**
- Petoskey, 161**
- Pewaukee Lake, 168**
- Pharyngitis, waters, Rockbridge Alum Springs, 131**
- Pharynx, larynx, and nose, chronic catarrh, 327. See also Respiratory Organs, Diseases.**
- Philadelphia, 103, 104, 105, 120, 122, 138, 174, 207; parks, 208; schools near, 216; schools of, 216**
- Philippines, dysentery, endemic in, 49; not available as health resorts, 49; smallpox, prevalence of, 49**
- Phoenix, 78, 180, 182, 183, 208, 353**
- Phosphatic gravel, 355, 357**
- Phosphaturia, baths, brine or sea, 358; exercise, 357; hydrotherapy, 358; muriated waters, 358. See also Urinary Organs, Diseases.**
- Phthisis. See Tuberculosis, Pulmonary.**
- Pickering, 56**
- Pico de Tarquino, 67**
- Pietermaritzburg, 30**
- Pike's Peak, 135, 152, 171, 177**
- Pillsbury, Captain J. E., U. S. N., 101**
- Pine Forest Inn, 139**
- Pine Hill, 115**
- Pine Lake, 163**
- Pine Park, 102**
- Pinehurst, 135; tuberculous patients not welcomed, 135**
- Pines, The Isle of, 70**
- Piney Woods Inn, 141**
- Pittsburg, 122, 124**
- Pittsfield, 99**
- Placid Lake, 111, 112, 331, 332**
- Plain, Arizona, 180**
- Placita, Arizona, 181; Mexican, 220**
- Platte Springs (Wyoming), 184**
- Plattsburg, 112**
- Pleasant Lake, 97**
- Pleurisy, acute or subacute, 331; climatic resorts, 331. And pleuritic effusion, remnants of, 331; high altitude resorts, 331; of tuberculous nature, high altitude resorts, 331; treatment, artificial aërotherapeutics, 332; treatment, hydrotherapy and gymnastics, 331. See also Respiratory Organs, Diseases.**
- Pleuritic effusion, passive, associated with cardiac weakness, baths, Nauheim, 332; effusion, passive, associated with cardiac weakness, Schott's resistance exercises, 332. See also Pleurisy and Respiratory Organs, Diseases.**
- Plombières, 269, 298, 345, 366**
- Plymouth Rock, 91**
- Pneumonia at Sucre, 55; convalescence from, Lake Pontchartrain, 148; convalescence from, Tarpon Springs, 147; croupous, mistaken for mountain fever, 168; sequelæ of, Atlantic City, 106. See also Respiratory Organs, Diseases.**
- Pocono, 78**
- Pocono Mountain, 79, 123**
- Point Conception, 159, 195; dividing-line at, 189**
- Point Pleasant, 103, 104**
- Poisoning, chronic metallic, 283; chronic metallic baths, Beck's Hot Sulphur Springs, 186; chronic metallic, climatic treatment, Egypt, 283; chronic metallic waters, diuretic, cholagogue, and laxative, 283; waters, thermal,**

283. See also *Diatheses and Toxemias*; and *Metallic Poisoning, Chronic*.
 Poland Springs, 95, 96, 345
 Polynesia, 47
 Polypt, nasal, 327
 Pontchartrain, Lake, 148, 149
 Pony, 185
 Poona, 31
 Port Arthur, 78
 Port Jervis, 122
 Port Limon, 63
 Port-au-Prince, 71
 Portland (Me.), 80, 89
 Portland (Ore.), 78, 188, 199, 207; for nervous recuperation, 199
 Portsmouth (Me.), 89, 90, 91
 Potash Sulphur Springs, 155
 Poughkeepsie, 115, 217
 Poussée, 385
 Powell, Sir R. Douglass, 286, 337
 Powhatan Alum Springs, 129
 Powhatan Lithia Springs, 129
 Pratt Institute, 215
 Premature senility, 302. See *Age, Old; Periods of Life, and Senility*.
 Prescott, 181, 183
 Pretoria, 29
 Prevention of pulmonary tuberculosis, 304, 315, 316
 Prince Edward Island, 81, 84
 Princess Anne Hotel, 108
 Princess Hotel, 76
 Princeton University, 217
 Profile, 332
 Profile Lake, 97
 Pro-plateau, Arizona, 180
 Protection in treatment of pulmonary tuberculosis, 315; factors in, 314
 Providence, 217
 Provincetown, 91
 Pseudorheumatic affections, 288
 Psoriasis, 383. See also *Skin, Diseases*.
 Pruritus, 383; associated with diabetes mellitus, 386; associated with glycosuria, 386; climatic treatment, 386. *See also Digestive Apparatus, Diseases; and Skin, Diseases*.
 Ptyalism developed at Hot Springs (Ark.), 154
 Puenta del Inca, 54
 Pueblo, 174, 177
 Puerto Rico, 70, 77
 Puget Sound, 188, 199, 200
 Pullney Hills, 36
 Pulmonary affections, acute, convalescence from, Egypt, 22; affections, chronic, waters, Red Sulphur Springs, 133. *Affections, climate*, Asheville, 136; Assouan, 18; Buena Vista (Pa.), 125; Carnelian Hot Springs, 199; Catskills, 115; Florida, 144; Fusagasuga, 61; Helouan, 18; Hot Springs (S. D.), 166; Luxor, 18; Morganton, 137; Santa Barbara, 193; Summerville, 140; Villetta, 61; White Mountains and adjacent regions, 97; convalescence from, Sanatorium Gabriels, 112; early stages, Sanatorium Gabriels, 112; incipient, Aiken, 138; treatment, Kumiss, 37; open-air, Colorado, 172; whey, warm, 250. *Emphysema*, climatic treatment, 328; due to senility, 329; sea voyages, 328. *Tuberculosis*. See *Tuberculosis*. See also *Convalescence and Respiratory Organs, Diseases*.
 Puna, 54
 Punta Arenas, 63
 Put-in-Bay Islands, 158
 Pyelitis, chronic, climatic treatment 358. See also *Urinary Organs, Diseases*
 Pyrmont, 269, 271, 273
- Q
- Quarantine laws at Mexican border, 219
 Quebec, 82, 200
 Quebec, Province of, 80, 81, 82
 Queens, Borough of, 100
 Quetame, 61
 Quezaltenango, 65
 Quito, 59
 Quogue, 102
- R
- Race, Cape, 83
 Rachitic and weakly children, climates, dry sunny inland, 279; and weakly children, climates, warm sheltered seaside, 279. See also *Children*.
 Radiant heat baths, 370
 Ragatz, 296, 370, 385
 Rain, freedom from, Lima, 50; rare in Luxor, 20
 Rainfall, abundant, southern slope of Ohio, 157; at Hawaii, 233, 238; at Honolulu, 235; in Arizona, 179, 181; in Australia, 40; heaviest on western shore of Florida, 147; light in sheltered valley region of Colorado, 179; light in southern California, 190; slight in Arizona plain, 179, 180
 Rainy season, Arizona, 181, 183; season, Bay St. Louis, 148; season, Bolivia, 55; season, Brazil, 57; season, Central America, 62; season, Cuba, 68; season, Ecuador, 59; season, India, 31; season, Jamaica, 66; season, Pacific Coast of United States 188; season, Pass Christian, 148
 Raleigh, 135, 218
 Ramleh, 23
 Ranch life, Colorado, 179
 Rangeley, 333
 Rangeley Lakes, 95
 Rangeley Lake region, 79
 Rangeley Mineral Spring, 96
 Rappahanock River, 130
 Raquette Lake, 111
 Rawley Springs, 130, 272
 Ray Brook, 112
 Raynaud's disease, 263, 355
 Recreation, mental, Cairo, 18; Egypt, 22; Maine woods, 96; Mount Desert, 87. See *Rest*.
 Rectum, chronic catarrh, climatic treatment, 348. See also *Digestive Apparatus, Diseases*.
 Red Bank, 209
 Red Bluff, 188
 Red Sulphur Springs, 133, 210
 Redlands, 78, 194, 287, 374
 Rehoboth Beach, 107
 Reichenhall, 246, 325, 330
 Renal affections associated with dyspepsia, 343; affections, chronic, Egypt, 22. *Affections, climates*, Assouan, 18; Helouan, 18; Luxor, 18; San Gabriel Valley, 193; milk diet, abused, 251; waters, Poland Springs, 95. *Calculus*, waters, Farmville Lithia Springs, 129. *Complications*, Australia, unsuitable, 38. See also *Kidney; Nephritis; and Urinary Organs, Diseases*.
 Resistance gymnastics, 247
 Resorts. See *Baths, Health Resorts, and Waters*.
 Respiratory affections, Comanjilla, 221; affections, convalescence from, Cape May, 107; affections, Minneapolis unsuitable for, 165; affections, St. Paul unsuitable for, 165. *Organs*, diseases other than tuberculosis, 327. *Diseases*, asthma, bronchitic, 335; cardiovascular, 334; in the aged, 334; mineral water resorts, 334; muriated alkaline spas, 335; neurotic, 334; pulmonary tuberculosis associated with, 325; spasmodic, 334; bronchiectasis, climatic treatment, 331; bronchitis, in

- young patients, 329; bronchitis, chronic, climatic treatment, 328; bronchitis, chronic, and pulmonary emphysema, milk and whey cures, 330; mineral water resorts, 330; ocean voyages, 330; sulphur spas, 330; catarrh, dry, West Indies, 65; chronic catarrh of pharynx, larynx, and nose, 327; convalescence from, Block Island, 94; Nantucket, 94; Vineyard Haven, 94; diseases other than tuberculosis, 327; hay-fever, climatic treatment, 333; local treatment, 332; remnants of pleurisy and pleuritic effusion, high altitude resorts, 331. *Passages*, catarrhal affections, Morristown, 121; catarrhal affections, chronic, Egypt, 22; chronic affections, waters, Roanoke Red Sulphur Springs, 131. *Tract*, irritative affections, Bahamas, 72. See also *Bronchitis*; *Catarrh*; *Laryngitis*; *Pleurisy*; *Pneumonia*; *Pulmonary*, etc.
- Rest and recreation, 248, 270; Adirondack region, 109; Aiken, 138; Australian resorts, 40; Bahamas, 72; Canadian Rockies, 84; Cape Breton, 82; Chautauqua, 116; Egypt, 22; Florida, 144; Greenbrier White Sulphur Springs, 133; hill stations, India, 32; Hot Springs (Va.), 130; Jamaica, 66; Lake County, California, 196; Lake Superior, 162; Lake Tahoe, 187; Lakewood, 120; Long Island, 102; Michigan, 160; Montreal, 81; New England resorts, 86; New Jersey coast, 103; Newfoundland, 84; Nova Scotia, 83; Palm Beach, 147; Pinehurst, 135; Pocono region, 123; Richmond, 129; San Gabriel Valley, 193; Santa Clara Valley, 196; Savannah, 142; Southern California, 190; Tarpon Springs, 147; towns of the United States, 202; Virginia coast, 108; West Virginia, 133; Yellowstone Park, 184; and recuperation, Bermuda, 76; Colorado, 173; Hawaii, 241; in open air, 265; prolonged, convalescence from acute rheumatism, 287.
- Resting-place, winter or spring, Barbados, 72
- Rheumatic affections, baths, thermal, Rotorua, 46; affections, baths, Carnelian Hot Springs, 108; affections, Bermuda, unsuitable, 76; affections, waters, Gettysburg, 226; affections, waters, Glenwood, 178; fever, 286
- Rheumatism at Lima, 56; baths, at Sucre, 55; hot mineral, Canon City, 177; hot sulphur, Greenbrier White Sulphur Springs, 134; mud, Las Vegas Hot Springs, 169; mud, Mudlavia, 159; San Diego de los Banos, 70; thermal, Naueheim, 287; warm, Highland Springs, 198; climates, Bahamas, unsuitable, 72; Fusagasuga, 61; Glen Summit, 123; Luxor not suitable, 20; Medical Lake, 201; Tucson, 183; Utah Hot Springs, 186; Villeta, 61; waters, Agua Caliente, 182; Banff, 84; Berkeley Springs, 134; Blue Lick Mineral Springs, 156; Burner's Springs, 130; Castle Creek Hot Springs, 183; Gilroy Hot Springs, 197; Hot Springs (Ark.), 154; Hot Springs, (N. C.), 137; Indian Springs, 140; Jordan's White Sulphur Springs, 130; Quetame, 61; Richfield Springs, 117; Saitillo, 221; Topeka Mineral Springs, 155; Topo Chico, 221; Villeta, 61; Warm Springs, 140; Yellow Sulphur Springs, 132. *Acute*, the heart after, 337. *Articular*, convalescence from, acute, 286; convalescence from, chronic, 287; convalescence from, climatic treatment, 287; convalescence from, prolonged rest, 287. *Chronic*, baths, Hot Mud Springs, 198; Hot Springs, 166; waters, Hot Springs (Va.), 130; Klamath Hot Springs, 198; Mount Clemens, 161. *Gonorrheal*, 288; climatic treatment, 288; mechanical and balneotherapeutic treatment, 288. *Obstinate*, baths, Beck's Hot Sulphur Springs, 186. *Subacute*, baths, Hot Springs (S. D.), 166
- Rheumatoid arthritis, Egypt, 22; arthritis, thermal baths and douches, Helouan, 22. See also *Arthritis*.
- Rhinitis, waters, Rockbridge Alum Springs, 131. See *Respiratory Organs, Diseases*.
- Rhode Island, 94
- Rhodes, Mr., 28
- Richfield Springs, 117, 272, 274, 328
- Richmond (Staten Island), 103
- Richmond (Va.), 108, 128
- Richmond Borough, 103
- Richmond Hills, 128
- Ridgefield, 99
- Rigi-Sheideck, 378
- Rio de Janeiro, 57
- Rio de la Platta, 54
- Rio Grande, 184; Grand Canon of, 184
- Rioja, 54
- Rippoldsau, 329
- Riverina plain, 41
- Riverside County (Cal.), 78, 190, 194
- Riviera, 23, 268, 284, 298; resorts, compared with Egypt, 21
- Roan Mountain (N. C.), 79
- Roan Mountain (Tenn.), 152, 153
- Roanoke Red Sulphur Springs, 131
- Rochester, 101, 116
- Rock Enon Springs, 130
- Rockaways, The, 100, 102
- Rockbridge Alum Springs, 131, 347
- Rockies, Canadian, 85; Rockies, Montana, 185. See *Rocky Mountains*.
- Rockland, 89
- Rockledge, 146
- Rocky Mountain Industrial Sanatorium, 176, 322
- Rocky Mountain region, health resorts of, 167; Arizona, 79, 179; Colorado, 79, 171; Idaho, 79, 179; Montana, 79, 185; New Mexico, 79, 169; Nevada, 79, 187; Utah, 79, 185; Wyoming, 79, 184
- Rocky Mountains, 84, 85, 110, 138, 151, 155, 167, 185; climatic differences from Andes, 51; compared with Andes, 51
- Roman Catholic Church, fast days, effects, 262
- Rome, 367
- Roncegno, 272
- Rondebosch, 25
- Rondout, 114
- Ronkonkomo, Lake, 100
- Rooms and dwellings, selection of, at health resorts, 265
- Rosbach, 356
- Roseburg, 188
- Rosseau Valley, 73
- Rosslund, 79
- Roswell, 171
- Rothenbrunnen, 372
- Round Island, 109
- Royal Sea-bathing Infirmary, Margate, 259
- Ruisseauumont, 334
- Ruppertsheim, 259
- Rush, Benjamin, 256
- Rush Hospital for Consumption, 322
- Rutgers College, 217
- Rutland (Mass.), 98
- Rye Beach, 91
- 8
- Sabathu, 33
- Sacramento Mountains, 171
- Sacramento River, 189
- Sacramento Valley, 195
- Saddle Mountain, 99
- Sag Harbor, 102
- Saginaw, 161
- Saint-Sauveur, 385

- Salina Cruz, 222; yellow fever at, 222
 Salisbury (Conn.), 99
 Salisbury (Md.), 127
 Salt Lake City, 185, 186
 Salt Lake Hot Springs Sanatorium, 186
 Salt River Valley, 78
 Salt Sulphur Springs, 133
 Salta, 54
 Saltillo, 221
 Salvador, 64
 San Antonio (Tex.), 150, 315
 San Bernardino (Cal.), 78, 194
 San Buenaventura, 194
 San Diego, 77, 188, 190, 191
 San Diego de los Baños, 70
 San Francisco, 77, 188, 192, 193, 195, 196, 197, 198, 214
 San Francisco Bay, 196
 San Gabriel, 78, 193
 San Gabriel Valley, 192
 San Jacinto Mountains, 191, 194
 San Joaquin River, 189
 San Joaquin Valley, 195
 San José, 63, 195, 196
 San José Valley, 194, 195
 San Juan, 54, 70
 San Luis, 54, 179
 San Luis Park, 179
 San Miguel, 64
 San Pedro, 191
 San Salvador, 64
 Sanatorium, The Aiken Cottages, 138; Battle Creek, 161; Boulder, 176; Braemar Wood End, 41; Claremont, 25; Clifton Springs, 117; Coronado, 190; Gabriels, 321; Hammon-ton, 120; Hôtel Dieu, 151; Hudson Hot Springs, 170; Kimberly, 28; Las Vegas Hot Springs, 169; Lemmonfontein Hotel, 27; Palmyra Springs, 163; Salt Lake Hot Springs, 186; Sao Paulo, 59; Saratoga, 114; Silao, 221; St. Vincent, Santa Fé, 169; Stroudsburg, 123; Tasmania, 42; Waldheim, 163. Treatment, importance of, 253. See also *Children, Scrofulous*; and *Tuberculosis, Pulmonary*.
 Sanatoriums at Colorado Springs, 177; at Goersdorf, 257; at Rotorua, 46; at Wernersville, 125; Indian, 31. For children, Atlantic City, 209; scrofulous and weakly, charitable, 259. For treatment of chronic diseases, Alma, 161; European, 258; Jackson, 116; Waldheim, 163. For treatment of mental cases, Milwaukee, 164. For treatment of nervous cases, Milwaukee, 164. For treatment of pulmonary tuberculosis, 257, 258, 259; see also *Tuberculosis, Pulmonary*. Ocean, 312. Private, 274. Seaside, California, 196; for scrofulous and weakly children, 259, 326
 Sand Hills, 141
 Sandstone Mountain, 141
 Sandstorms, Ojai Valley, 195
 Sandusky Bay, 158
 Sandwich Islands, 47, 48, 223; suitability of, for ordinary constitutions, 48. See *Hawaii*.
 Sandwith, Dr., 18
 Sandy Hook, 103
 Sanover, 33
 Santa Barbara, 193, 268, 287, 359
 Santa Catalina Island, 191
 Santa Catarina, 272
 Santa Clara, 195, 196, 197
 Santa Clara Valley, 195
 Santa Cruz (Cal.), 196
 Santa Cruz Mountains (Jamaica), 67
 Santa Cruz Mountains (Cal.), 195
 Santa Fé, 53, 54, 169
 Santa Fé de Bogota, 60
 Santa Monica, 193
 Santa Ysabel, 285
 Santiago, 52
 Santiago del Estero, 54
 Santo Tomas, 65
 Sao Paulo, 58
 Saranac, 110, 111, 112, 113
 Saranac Lakes, 110, 111
 Saratoga, 109, 113, 114; disadvantages, 114
 Saskatchewan, 80
 Sault Ste. Marie, 78, 161
 Savannah, 142, 143, 189, 367; dengue fever prevalent, 143; malaria prevalent, 143
 Savannah River, 140, 142, 143
 Saxony, 257
 Schinznach, 285, 385
 Schlangenbad, 131, 320, 340, 366
 School of Design for Women, 215
 Schooley's Mountain, 121
 Schott, Dr., at Nauheim, 247
 Schott's resistance exercises, 372
 Schwalbach, 269, 271
 Sciasconset, 92, 333
 Sciatica, 360; Egypt, 22; mud-baths, Mudlavia, 159; thermal baths and douches, Helouan, 22; waters, Berkeley Springs, 134; waters, thermal, Caledon, 26; with gouty tendency, 370. See also *Nervous System, Diseases*.
 Sclerosis, 364
 Sconset, 82
 Scrofula and chronic tuberculous affections other than pulmonary tuberculosis, 323; baths, brine, 325; baths, gaseous thermal, 325; climates, marine, 324; prevention of, in children, 323; sea-voyages for, 324; waters, Gilroy Hot Springs, 197; waters, muriated, 325; waters, sulphurous mineral, 325
 Scrofulous affections, waters, Barium Springs, 137. Children, 323; and weakly, baths, brine waters, 259; sanatoriums, charitable, 259; sanatoriums, seaside, 326. See also *Children*.
 Sea Bright, 103
 Sea Cliff, 102
 Sea Girt, 103
 Sea Haven, 103
 Sea Isle City, 103
 Sea Point, 25
 Sea and air, temperatures, California, table, 191
 Sea-bathing, 253. Resorts, Atlantic City, 105; Avalon (Cal.), 191; Bar Harbor, 87; Beach Haven, 104; Block Island, 93; Camden (Me.), 89; Cape Arundel, 89; Castine, 88; Connecticut, 95; Coronado, 100; Cumberland Island, 143; Deer Isle, 89; Delaware, 107; Fire Island, 102; Frenchman's Bay, 88; Gilkey's Harbor, 88; Islesboro, 88; Isle au Haut, 89; Isle of Hope, 143; Isles of Shoals, 91; James-town, 94; Kalk Bay, 25; Kennebunkport, 89; Kittery, 90; Little Boar's Head, 91; Long Beach (Cal.), 193; Long Branch, 104; Long Island, 100, 102; Martha's Vineyard, 93; Monterey (Cal.), 106; Mount Desert, 86; Nantucket, 93; Narragansett Pier, 94; New England, 86; Newport (Ore.), 109; Newport (R. I.), 84; New Jersey, 103; Northeast Harbor, 87; Ocean City (Md.), 108; Ogunquit, 90; Old Point Comfort, 108; Passaconaway, 90; Portsmouth, 90; Rye Beach, 91; San Diego, 190; Santa Barbara, 193; Santa Catalina Island, 191; Santa Cruz, 196; Santa Monica, 193; Seal Harbor, 87; Seaside (Cal.), 106; southeastern coast of Massachusetts, 91; Southwest Harbor, 87; Staten Island, 103; Sullivan Island, 143; Tarpon Springs, 147; Thunderbolt, 143; Vedado, 89; Vinal Haven, 89; Virginia Beach, 108; Watch Hill, 94; Watonsville, 106; Wentworth Hotel, 90; Winter Harbor, 88; York Beach, 90; York Harbor, 90
 Seal Harbor, 87
 Seashore resorts. See *Health Resorts, Coast*; and *Health Resorts, Seaside*.

- Seaside, influence of, on digestive disorders, 249; injurious in active ulceration of lung or larynx, 306, 308; resorts, selection of rooms and dwellings at, 266. See also *Health Resorts*.
- Seaside (Cal.), 106
- Seaside Park, 103, 104
- Season of year as element in selection of a health resort, 264. Rainy. See *Rainy Season*.
- Seattle, 78, 83, 200
- Selection of health resorts, 260. Elements in, constitution of patient, 261; expense of treatment, 264; inclinations of patient, 264; opportunities for open-air treatment, 265; season of the year, 264; selection of rooms and dwellings, 265
- Senility, premature, 302; premature, pulmonary emphysema due to, 329. See *Age, Old, and Periods of Life*.
- Serrezuela, 61
- Setauket, 101, 102
- Seton Hospital, 321
- Sewell's Point, 103
- Sexual power, diminished, 360
- Sexual system, diseases, in men, 360. Impotence and diminished sexual power, climatic treatment, 360; sea-voyages, 361. Nocturnal emissions, climatic treatment, 360
- Sexual system, diseases, in women, 361. Abortion and sterility, balneotherapeutic treatment, 363; climatic treatment, 363; Nauheim treatment, 363. Amenorrhea, due to anemia, climatic treatment, 361. Dysmenorrhea, baths, simple thermal, 362; neurotic forms, 362; open-air exercise, 362. Leukorrhea, 362. Menopause, disorders, 363. Menorrhagia associated with uterine fibroids, 361; climatic treatment, 361; hydrotherapeutic treatment, 361. Metritis, chronic, 362. Parametritis, and perimetritis, lingering effects, 362
- Shannondale Springs, 134
- Sharon (Mass.), 204
- Sharon Sanatorium, 321
- Sharon Springs, 117, 272, 328, 370, 381
- Shaw University, 218
- Shawangunk Mountains (N. Y.), 121
- Shawangunk Mountains (N. Y.), 79, 116, 317
- Shealtiel Mineral Springs, 161
- Sheboygan Mineral Well, 163
- Shelter Island (L. I.), 102
- Shelter Islands (R. I.), 95
- Shinnecock Bay, 100
- Shinnecock Hills, 102
- Shockoe Hills, 128
- Shovel Creek, 198
- Sicily, 366
- Sick headache. See *Headache*.
- Sierra Madre Mountains, 192
- Sierra Mountains (Cal.), 79, 190
- Sierra Nevada Range, 187, 189
- Sierra ranges, 78
- Silao, 221
- Silver City, 170
- Silver Lake, 97
- Simla, 31, 32, 34
- Simpson, Dr. W. J. J., 31, 32, 36
- Sitka, 188
- Skaneateles Lake, 118
- Skin, affections, 383; affections, baths, Beck's Hot Sulphur Springs, 186; affections, climatic resorts, Medical Lake, 201; affections, mineral water health resorts, 384; affections, stations, medium of temperature United States of Colombia, 60; affections, phototherapeutic measures, 383; affections, waters, Byron Springs, 385; Carnelian Hot Springs, 198; Glenwood, 178; Greenbrier White Sulphur Springs, 134, 385; Healing Springs, 385; Hot Springs (Ark.), 385; Indian Mud Springs, 385; Klamath Hot Springs, 198; Napa Soda Springs, 385; Proserpine Spring (Ind.), 159; Quetame, 61; Richfield Springs, 385; Saltillo, 221; Saratoga Vichy, 385; Sharon Springs, 385; Villeta, 61. Acne and acne rosacea, climatic treatment, 384. Boils, 386. Chronic, waters, Crockett Arsenic-Lithia Spring, 132; waters, Gilroy Hot Springs, 107; waters, Yellow Sulphur Springs, 132. Due to anemia, spa treatment, 383. Eczema, 383; climatic treatment, 384; spa treatment, 385; chronic, baths, Loecheles-Bains, 384. Furunculosis, chronic, 386. Idiosyncrasies, 384. Kaposi's disease, 384. Lupus erythematosus, 384. Poussee, due to bathing, 385. Psoriasis, 383. Pruritus, 383; in neurasthenic and fatigued individuals, 386; possibility of glycosuria and diabetes mellitus in, 386. Syphilitic, climatic and balneotherapeutic treatment, 383. Tuberculous, 383. Urticaria, 386. Weakness, climatic treatment, 387
- Skyuka (New Mexico), 170
- Sleep, amount required, 379. Defective, 378; climatic treatment, 378; hydrotherapy, 378; sea-voyages, 378; simple thermal spas, 378. Disorders, causes, 378. Excessive, 379; climatic and spa treatment, 380; massage and Swedish gymnastics, 380; open-air exercise, 379. See also *Insomnia*; and *Nervous System, Disorders*.
- Smallpox, in Cuba, parts of, 69; in Guatemala City, 65; in Mexico, 220; in Philippines, 49; in Santiago, 53; in Valparaiso, 53
- Smith, Archibald, 29, 51, 55, 56, 310
- Smith College, 216
- Smith, Lorrain, 271
- Society Islands, 47
- Socorro, 170
- Soden, 325
- Solly, Dr. S. Edwin, 56, 173, 181, 307, 320
- Solomon Islands, 47
- Somer's Point, 103, 104
- Soolbäder, 269
- Sorata, 54
- Soroché, 54
- Sorrento, 23
- Sour milk, 250
- South Alabama, 152
- South America, Continent of, 72; health resorts, 50
- South Beach, 103
- South Bethlehem, 217
- South Carolina, 77, 78, 137, 138, 142
- South Dakota, 78, 83, 166
- South Hadley, 217
- South Hampton (L. I.), 102
- South Island, 44
- South Orange, 121
- South Park, 178
- South Poland (Me.), 95
- Southern Pines, 135
- Southwest Harbor, 87
- Spa, 269, 271, 273
- Spain, 366
- Sparta, 163
- Sparta Mineral Wells, 163
- Spartanburg, 139
- Spasmodic asthma. See *Respiratory Organs, Diseases*.
- Special therapeutics of climate, 267
- Spence's Bridge, 80, 81
- Spengler, Dr. L., 307, 311
- Spitfire Lake, 112
- Spofford Lake, 97
- Spokane Falls, 201
- Spondylitis deformans, 290
- Spondylose Rhizomélisque, 290
- Spragueville, 123

- Spray River, 84
 Spring, Bath (Ind.), 159; Bethesda (Waukesha), 163; Bowles (Ind.), 159; Bowling Alley, (Bedford Springs), 125; Champion (Saratoga), 113; Clysmic (Waukesha), 163; Congress (Saratoga), 113; Eye-water (Sharon Springs), 117; Fountain (Waukesha), 163; Gardner Magnesia (Sharon Springs), 117; Geyser (Saratoga), 113; Gibson (Waukesha), 163; Glenn (Waukesha), 163; Hathorn (Saratoga), 113; High Rock (Saratoga), 113; Horeb (Waukesha), 163; Katalysine (Gettysburg), 126; Kissingen (Saratoga), 113; Main Spring (Bedford Springs), 125; Mineral Rock (Waukesha), 163; Pluto (Ind.), 159; Pure Spring (Bedford Springs), 125; Seltzer (Saratoga), 113; Siloam (Waukesha), 163; Silurian (Waukesha), 163; Sulphosaline Spring (Cincinnati), 158; Sulphur Spring (Bedford Springs), 125; Vesta (Waukesha), 163; Vichy (Saratoga), 113; Vitaqua (Waukesha), 163; White Rock (Waukesha), 163; White Sulphur (Sharon Springs), 117. See also *Waters*.
 Spring Garden Institute, 215
 Spring Lake, 103
 Spring resort, Atlantic City, 105; resort, Citronelle, 152; resort, Greenbrier White Sulphur Springs, 133; resort, Lakewood, 120; resort, Los Angeles, 192; resort, Summerville, 140
 Springdale Seltzer, 345
 Spruce Cabin, 123
 Squan Beach, 103
 St. Anthony's Sanatorium, 322
 St. Augustine, 146, 367, 376
 St. Beatenberg, 369, 378
 St. Blasien, 331
 St. Clair, Lake, 81
 St. Clair River, 161
 St. Clair Springs, 161
 St. Eustatius, 73
 St. George, 103
 St. Jean-de-Luz, 268
 St. John River (Me.), 96
 St. Johns, 83
 St. John's River (Fla.), 146
 St. Joseph's Hospital for Chronic Diseases of the Chest, 321
 St. Kilda, 40
 St. Kitts, 73, 74
 St. Lawrence, 81
 St. Lawrence, Gulf of, 80, 188
 St. Lawrence River, 109
 St. Lawrence Valley, 78, 98, 110
 St. Louis, 153, 212
 St. Louis University, 215
 St. Lucia, 73
 St. Moritz, 253, 269, 272, 298
 St. Paul, 164, 165; catarrh, chronic, of the air-passages prevalent at, 164; diphtheria prevalent at, 164; influenza prevalent at, 164; rheumatism, prevalent at, 164
 St. Pierre, 75
 St. Sebastian Hospital for Epidemic Diseases, Rio de Janeiro, 57
 St. Simon's Sound, 143
 St. Vincent, 164; diphtheria prevalent at, 164; influenza prevalent at, 164; rheumatism prevalent at, 164
 St. Vincent Sanatorium (N. Mex.), 169
 Stamford, 99
 State Board of Health of New Jersey, 107
 State University of Georgia, 218
 Staten Island, 103, 203
 Staunton, 130
 Ste. Agathe des Montes, 82
 Stephen, Mount, 85
 Sterility and abortion, habit, climatic treatment, 363. See *Sexual System, Disorders, in Women*.
 Stewart Island, 44
 Stockbridge, 99
 Stokes, 339
 Stomach and intestines, irritation and chronic catarrhal conditions, 344. *Disorders of*, 341; at Lima, 56; *waters*, Cambridge Springs, 125; Catoosa Springs, 140; Richfield Springs, 117. See *Digestive Apparatus, Diseases and Disorders*.
 Stonington, 95
 Stowe, 98
 Strasser, 292
 Strathpeffer, 298
 Strawberry Valley, 194
 Strontia Springs, 127
 Stroudsburg, 122, 123
 Strumous habit, 323
 Stryker Mineral Springs, 158
 Stubbert, Dr. J. Edward, 116
 Sucre, 65
 Sugar Hill, 301
 Sullivan Island, 142
 Sulphur Spring Valley, 184
 Sulphur Springs. See *Waters*.
 Summer climate, inland resorts of Massachusetts, 98; climate, towns and villages of western Connecticut, 99; residence, Lake Placid, 112. See *Climates and Health Resorts*. *Resorts*, Antelope Park, 179; Bay St. Louis, 148; Campobello, 86; Cloudercroft, 171; Cloudland, 152; Cumberland Island, 143; Deer Park, 127; Eaglesmere, 124; Egeria Park, 179; Glen Alpine Springs, 137; Green Bay, 163; Greenbrier White Sulphur Springs, 133; Isle of Hope (Ga.), 143; Jamestown (R. I.), 94; Jordan's White Sulphur Springs, 130; Kennebunkport, 89; Kittery, 90; lake front, Michigan, 160; lake front, Wisconsin, 162; Lake Minnetonka, 165; Long Island, 100; Manitou Park, 179; Martha's Vineyard, 92; Massachusetts, 98; southeastern coast of Massachusetts, 91; Minnequa, 124; Mountain Lake, 132; Narragansett Pier, 94; Nevada, mountain stations, 187; New England States, 86; New Jersey coast, 103; Newfoundland, 83; Newport (Ore.), 199; Newport (R. I.), 94; Oconowoc, 163; Ogunquit, 90; Old Point Comfort, 108; Pass Christian, 148; Passaconaway, 90; Portsmouth (Me.), 90; Put-in-Bay Islands, 158; Rhode Island, 94; Roanoke Red Sulphur Springs, 131; Santa Barbara, 193; Santa Fe, 169; Santa Monica, 193; Stroudsburg, 122; Sullivan Island, 142; Thunderbolt, 143; Virginia, 131; Virginia Beach, 108; Virginia coast, 108; Wentworth Hotel, 90; Wisconsin, 163; York Harbor, 90; cool, invigorating, Montgomery White Sulphur Springs, 132; tonic, exhilarating, late, Berkshire Hills, 99. *School*, Chautauqua, 116; Newport, 199; Sweet Water Park, 140; *nature*, for children, Mystic, 95. *Station*, Deer Isle, 89; Isle au Haut, 89; Stowe, 98; Vinal Haven, 98. See also *Climates; Health Resorts; Mountains; Seaside*.
 Summerville (Ga.), 140
 Summerville (S. C.), 138, 139
 Summerville Heights, 141
 Summit, 121
 Summit Soda Springs, 345
 Sunapee Lake, 97
 Sunshine, amount, central plateau of Mexico, 220; Colorado Springs, 177; percentage, Arizona, 182; percentage, Augusta, 140; percentage, Salt Lake City, 185; percentage, Tennessee, 153
 Superior, Lake, 80, 81, 161, 162
 Swannanoa River, 136
 Swarthmore College, 216
 Sweet Chalybeate Springs, 131, 374
 Sweet Springs (Mo.), 153

Sweet Water Park, 140
 Swiftwater, 123
 Switzerland of America, 197
 Sydenham, 256
 Sydney (Can.), 80

Syphilis, connection between, and various morbid conditions, 280, 281; hydrotherapy and balneotherapy for, 281. **Resorts**, 280; summer, 282; winter, 282. **Rest and open-air treatment**, 282. **Tertiary baths**, Beck's Hot Sulphur Springs, 186. **Treatment**, 279. **Toxins**, 281. **Waters**, Glenwood, 178; Hot Springs (Ark.), 154; Topo Chico, 221; Utah Hot Sulphur Springs, 186. See also *Diathe-sis and Toxemias*.

Syphilitic cachexia, 282; diseases, hot climates, United States of Colombia, 61; eruptions, waters, Agua Caliente, 182; skin diseases, 383

T

Tabes dorsalis, 368; antisiphilitic measures, 368; causes, 368; hydrotherapeutic treatment, 368; methodic muscular exercises, Dr. Frenkel, 369; paresthesias, 368; warm baths, Lammalou, 368; warm baths, Oeynhausen, 368. See also *Nervous System, Diseases*.

Tacoma, 78, 200

Tacuman, 54

Tahiti, 47

Tahoe City (Nev.), 187

Tahoe Lake (Cal.), 198

Tahoe Lake (Nev.), 187

Tallac, 187

Tampa, 148, 325

Tampa Bay Hotel, 148

Tannersville, 115

Tarasp, 274, 297, 298, 345, 380

Tarkastad, 27

Tarma, 55

Tarpon Springs, 147

Tarrytown, 100, 115

Tartary, Steppes of, 37

Tasmania, 42

Tasmania, the sanatorium of Australasia, 42

Tassilloquells of Hall, 372

Tatoosh Islands, 188, 199

Taylor's Station, 139

Tazewell, 132

Tehuantepec, 222; yellow fever, cholera, and smallpox at, 222

Teinach, 329

Temperate zone of Mexico, 219

Temperature, variation of, Egypt, 18

Temperatures at Hawaii, 225-227

Tenement houses, New York city, 204

Tennessee, 152

Tennessee River, 152

Terrain-cur, 246, 339

Terrain-Curorte. Baden-Baden, 246, 339; Meran, 246, 339; Reichenhall, 246; utilization of patient's place of residence, 339

Texas, 78, 149, 150; quarantine laws, 219

Texas Hill (Ariz.), 179

Thames River (Conn.), 95

The Home, Denver, 322

Therapeutic employment of climates, health resorts, and sanatoriums, 245

Therapeutics, general, of climate, 245; special, of climate, 267

Theresa Lake, 109

Thermal baths, Helouan, 22. See also *Baths; Douches; Hot Springs; and Waters*.

Thermal spring district, New Zealand, 45

Thermal waters. See *Waters, Hot, and Waters, Thermal*.

Thomasville, 78, 141, 308

Thompson, Symes, 26, 27, 28, 30

Thompson, Dr. Wyville, 226

Thorp's Spring, 272

Thousand Islands, 109

Throat affections, early stages, Camden (S. C.), 138; affections, winter climate of Cleveland unsuitable for, 158. See also *Respiratory Organs, Diseases*.

Thunderbolt, 143

Thuringia, 258

Tibet, elevated plateaus of, 37

Tic douloureux, 370. See also *Nervous System, Diseases*.

Tocaima, 60

Titusville, 146

Tombstone, 181

Tompkinsville, 103

Toms River, 103

Tonga Islands, 48

Toowoomba, 42

Topeka, 155

Topo Chico, 221

Toronto, 80, 81, 82

Torpid persons, functional nervous disorders, 365; persons, selection of health resorts for, 261

Torpor, hepatic, waters, Bedford (Pa.), 125; Glenwood, 178. See *Liver, Affections of, and Bile-ducts*.

Torquay, 324, 353

Torres, Dr., 220

Tottenville, 103

Town life, Denver, 38, 174; life, high altitude resorts in the Rocky Mountains, 38, 174; life, Mexico, 39, 220

Towns of the United States, 202; university, of the United States, 215

Toxemias and diatheses. See *Diathe-sis and Toxemias*.

Traveling as a therapeutic measure, 261; clothing for, 254; fatigues of, as element in selection of health resorts, 264

Treatment at health resorts, elements, 245.

Elements, baths, 253; clothing, 253; diet, 247; exercise and mechanotherapy, 246; grape cures, 251; hydrotherapy, 253; medical supervision, 254; milk cures, 249; mineral waters, 253; rest and recreation, 245; sanatorium treatment, 255

Trees, hygienic value, Rio de Janeiro, 57

Trenton, 103

Trinidad, 72

Truckee (Cal.), 198

Trudeau, Dr. E. L., 113, 321

Tryon, 136

Tuberculosis, acute miliary, 317

Tuberculosis and tuberculous affections, 303;

at Lima, 56; at Santiago, 53; in Valparaiso, 53; death-rate from, in Bermuda, 76; in Brazil, 59; diseases of respiratory organs other than, 327; freedom from, Steppes of Tartary, 37; low in New Hampshire, 90; unknown among natives, Bolivia, 54; unknown among natives, Zacatecas, 220

Laryngeal, active, sea-coast counterindicated, 306, 308; Egypt unsuitable, 21; high altitudes, 306, 307 skilled treatment necessary, 21, 307

Tuberculosis, pulmonary, 303; pulmonary, curability of, 303, 320

Advanced, with fever, 306

Chronic, 319; with catarrh, 309; with emphysema or cardiac disease, 309

Climates, Adirondack region, 110; Aliwali North, 27; Andes, 51, 315; Andes, disadvantages of, 51; Argentina, 53; Arizona, 180, 307; Australia, 38; Australia, inland districts, 39; Australia, limitations of, 38; Australian littoral region, unsuitable, 40; Bahamas, unsuitable, 72; Berkshire Hills, 99; Bermuda too moist for some cases, 75; Blue Ridge region,

123; California, 315; Cape Breton, unsuitable, 82; Cape May, unsuitable, 107; Catskills, 115; central plateau of Mexico, 39, 220; Cloudland, unsuitable, 152; Colorado, 172, 307, 315, 319; desert of Egypt, 21, 310, 312; Durango, 222; Egypt, 21; Florida, temporary refuge, 144; Hawaii, unsuitable, 240; high altitude, 310; Highland Springs, 198; hill stations, India, 32; Los Angeles, unsuitable, 192; Martha's Vineyard, unsuitable, 92; Mexico, 220, 315; Minneapolis, unsuitable, 165; Monterey (Cal.), unsuitable, 196; mountain, 315; mountains of California, 315; mountains of Europe and North America, 51; New Jersey pine belt, 119; New Mexico, 169, 307; Rocky Mountains, 167; sea-voyages, 305, 306, 308, 311, 315, 317, 319; selection of, 304; selection of, for strong constitutions, 305; selection of, for weak constitutions, 305; sheltered, 315; Southern California, 189; St. Paul, unsuitable, 165; Steppes of Tartary, 37; Swiss Alps, 51, 315, 319; Tampa, unsuitable, 148; White Mountains, 315; Wisconsin, unsuitable, 162. Complicated cases, Harrismith unsuitable, 29. **Complications**, albuminuria, Egypt, 21; asthma, 309; bronchiectasis, Egypt, 21; bronchitis, Egypt, 21; cardiac disease, 309; diabetes, 308; diabetes, Egypt, 21; emphysema, 309; hemorrhage, Bermuda, 75; laryngeal and intestinal ulceration, 21, 306; renal disease, 308, 354. **Extensive**, without fever, 306. **Fibroid**, 319; Atlantic City, 106. **Florida**, 317. **Hospitals for**, 258, 320; Boston, 259; Chicago, 259; Free Hospital for Poor Consumptives, Pennsylvania, 322; General Hospital for Treatment of Pulmonary Tuberculosis, Fort Bayard, 322; Hospital for Diseases of the Lungs, Chestnut Hill, 322; Massachusetts State Hospital for Consumptives, 321; National Jewish Hospital for Consumptives, Denver, 322; New York, 259; Philadelphia Hospital, wards, 259; Royal National Hospital, Ventnor, for poor, 258; Rush Hospital for Consumption, Philadelphia, 259, 322; Seton Hospital, N. Y., 321; St. Joseph's Hospital for Chronic Diseases of the Chest, N. Y., 321. See *Sanatoriums*. **Incipient**, Adirondack Cottage, Sanatorium, 111; Atlantic City, 106; Harrismith, 29; Morristown, 121; New York State Hospital, 112; Ray Brook, 112; Sanatorium Gabriels, 112. **Limited**, 305; limited in space, 318, 319; limited in time, 317. **Patients**, classes of, 304, 316, 317; classes benefited by hardships, 315; classes needing comforts, 315; classes, suited by Egyptian climate, 21; constitution of, 305; hardy, Andes, 51; hardy, Arizona, 181; hardy, Arizona pro-plateau, 181; hardy, Australia, 38; hardy, Blue Ridge region, 123; hardy, Colorado ranch life, 179; hardy, Mexico, 220; hardy, mountain resorts, 305; hardy, sea-voyages, 305; hardy, South Africa, 24; pyrexial reaction of, 314; supervision, medical, 303, 304, 312, 313; supervision, medical, insufficient, Andes, 51; Arizona pro-plateau, 181; Colorado Parks, 179; Mexico, 220; Ramlah, 23; tendencies of, to limit morbid processes, 317; weak, humid resorts, 305; weak, warm, sunny resorts, 305. **Prevention**, 304, 315, 316. **Progressive**, with fever, 308. **Quiescent cases**, 308; Atlantic City, 106; mineral water resorts, 313. **Recurrent**, 318; recurrent, with fever, 318; with persistent fever, 316. **Resorts**, Adirondacks, 316, for winter

months, 111; Aiken, 138, 310, 315; Albuquerque, 170; Algiers, 315; Aliwal North, 27; Alleghanies, 308; Amélie les Bains, 312; Arcachon, 309, 315; Arco, 308; Arizona, 315; Asheville, 136, 310, 316; Atlantic City, 106, 308, 316; Badenweiler, 308; Bains, 312; Bartow, 309; Beaulieu, 305; Belize, 64; Bloemfontein, 28; Blue Ridge region, 123; Boerne, 150; Bogota, 60; Boulder, 176; Bournemouth, 308, 309; Buena Vista, 125; Calgary, 85; Camden (S. C.), 138, 309; Canary Islands, 309; Cauterets, 312; Castle Creek Springs, 310; Catskills, 310; Charleston, 142; Citronelle, 152; Cloudland, 152; Colorado Springs, 177, 319; Comanillo, 221; Coronado, 309; Cresson, 125; Cumberland Range, 316; Deer Park, 31; Denver, 174; Durango, 222; Eaux Bonnes, 312; Egypt, 308; El Paso, 157; Estes Park, 307; Fallsburg, 116; Flagstaff, 183; Florida, 308; Gardone-Riviera, 308; Georgia, 308; Gleichenberg, 312; Glen Summit, 123, 309; Goerbersdorf, 319; Grasse, 309; Gravenhurst, 81; Hammonton, 119, 120, 308; Harrismith, 28; high altitude, 310; Highland Springs, 198; Hot Springs (S. D.), 166; Hot Springs (Va.), 309, 310; Huancayo, 55; Hurleyville, 116; Idyllwild, 316, 319; Isle of Pines, 70; Isles of Shoals, 91; Isle of Wight, 315; Janja, 55; Kamloops, 85; Kane, 124, 311; Kissimmee, 309; La Bourbelle, 312; Lakeland, 309; Lakewood, 120, 308, 315, 319; Las Cruces, 171; Las Vegas, 168; Las Vegas Hot Springs, 309; Laurentians, 82; Le Vernet, 310; Liberty, 116; Liberty Falls, 116; Lippspringe, 313; Locarno, 309; Look-out Mountain, 153; Luchon, 312; Madeira, 305, 309; Mentone, 305, 315; Meran, 308, 309, 315, 319; mineral water, 312; Monticello, 116; Montreux, 308, 309; Morganton, 136; Morristown, 121; Neversink, 116; New Jersey, 308; New Mexico, 316; Nordrach (Black Forest), 258; Obersalzbrunn, 313; Ocala, 309; Ojai Valley, 195; Orlando, 309; Palm Beach, 308; Parks of Colorado, 178; Pasadena, 192, 309; Pau, 305, 309; Peru, 55; Phoenix, 182, 315; Pocono, 123; Pony, 185; Prescott, 183; Red Sulphur Springs, 133; Reinerz, 313; Riviera, 308; Roswell, 171; San Antonio, 315; San Diego, 190; San Gabriel Valley, 193; Santa Barbara, 193, 309, 315; Santa Fé, 169; Sao Paulo, 59; Saranac, 112; Schooley's Mountain, 121; Shawangunks, 316; Silver City, 170; Socorro, 170; Southern California, 308, 316; Southern Pines, 135; Summerville, 141; Tarma, 55; Thomasville, 141, 308, 309, 310; Tucson, 183; Villetta, 61; Vineland, 119; Virginia, 316; Walla Walla, 201; Weissenburg, 313; White Haven, 123; White Mountains, 97; Winter Park, 309; Woodburne, 116; Zacatecas, 220. **Sanatoriums**, 257, 258, 320; Adirondack Cottage Sanatorium, 321; Arosa, 257; Black Forest, 257; Boulder, 176; Brooklyn Home for Consumptives, 321; Chestnut Hill Home, Philadelphia, 259; Citronelle, 152; Coronado, 100; Davos, 257; Denver, 176; Falkenstein, 257; Fort Bayard, soldiers, 170, 322; Fort Stanton, sailors, 170, 322; Free Home for Consumptives, Boston, 321; Glockner Sanatorium, 322; Goerbersdorf, 257; Gravenhurst, 181; high altitude, Switzerland, 257; Hohenhonnef, 257, 258; Idyllwild, 194; Kimberley Sanatorium, unsuitable, 28; Ladies' Home Sanatorium, Las Vegas, 322; Latta Sanatorium, 322; Laurentian Sanatorium, 82, 321; Leysin, 257; Liberty Heights, 116; Loomis Sanatorium, 321; Lucien Moss Home, Olney, Philadelphia, 259, 322; Massachusetts, 98; military hospital, Jauja, 55; Montefiore Home Country Sanatorium, 259, 321; Muskoka Sanatorium, 258, 320, 322; Nordrach

(Black Forest), 258; ocean, 312; park region of Minnesota, 165; Pasteur Sanatorium, 321; Riviera, 22; Roswell, 171; Rutland, 258; Sanatorium Gabriels, 321; Saxony, 257; Sharon Sanatorium, Boston, 258, 321; St. Anthony's, East Las Vegas, 322; St. Vincent's, Santa Fé, 169; The Home, Denver, 322; Thuringia, 258; White Haven, 123; sanatoriums for the poor, Falkenstein Sanatorium, 258; Mount Vernon Hospital, Hampstead, 259; National Sanatorium, Bournemouth (Eng.), 258; of England, 258, 259; of Germany, 259; of Switzerland, 259; of the United States, 259, 322; Ruppertsheim, 259
 Slowly progressive, 308
 Treatment, aerotherapy, artificial, 314; altitude and lowland compared, 173; climates, selection of, 304, 305, 316; climatic effects, artificial, at home, 314; climatic, general considerations, 303, 314, 320; home, 303, 314; hydrotherapy, 313, 314; hygienic, principles of, 257; milk, 251; open-air hill stations, India, 32; open-air, systematic, 257; protection, 314, 315; reinvigoration by physiologic means, 257, 315; sanatorium, 256-259, 306, 320-322; sanatorium and open compared, 173; sea-voyages, 305, 306, 308, 311, 315, 317, 319; suitable to temporal and spatial relations of cases, 317; waters, Red Sulphur Springs, 133. See also *Sanatoriums*.
 Tuberculous affections, chronic, of bones, Cape May, 107; affections of joints and bones, 325; affections of lymph glands, 325; affections of the skin, climatic treatment, 383. See also *Tuberculosis*.
 Tuckerton, 103, 105
 Tucson (Ariz.), 179, 183, 353, 375
 Tufts College, 216
 Tulane University, 215
 Tupper Lakes, 111
 Tuxpan, 222
 Twin Mountain, 96, 333
 Twofold Bay, 40
 Tybee Island, 143
 Typhoid fever. See *Fever, Typhoid*.
 Typhus unknown in Guatemala City, 65

U

Ubaque, 61
 Ukiah, 285
 United States Army Sanatorium, 170, 322
 United States Fish Commission, 62
 United States Hay Fever Association, 333
 United States Marine Hospital Sanatorium, 170, 322
 United States Military Academy, 115, 217
 United States Naval Academy, 217
 United States of America, 77, 79, 86, 253; Pacific Coast of, 189; towns of, 202; university towns of, 215
 United States of Colombia, 59
 United States Weather Bureau, 92
 University of Chicago, 215
 University of Colorado, 218
 University of Kansas, 218
 University of Michigan, 218
 University of Missouri, 218
 University of Pennsylvania, 215
 University of Wisconsin, 218
 University towns of the United States, 215
 Upper Egypt, 20
 Upper Saranac Lake, 112
 Upper St. Regis Lake, 112
 Urethral stricture and chronic gonorrhea, Willdungen, 359
 Urethritis, chronic, mineral water health resorts, 359; chronic, sea voyages, 359; gouty, 359. See also *Urinary Organs, Diseases*.
 Uriage, 250, 285, 370

Uric acid gravel, waters, Harris Lithia Springs, 139; acid gravel, wiley as a preventive, 258
 acid, waters, Capon Springs, 134. See also *Calculus, Gouty Conditions, and Urinary Organs, Diseases*.
 Urinary bladder, chronic catarrh, climatic treatment, 358
 Urinary organs, diseases, 353. *Albuminuria*, complicated with anemia, 354; lower and temporary forms, 354. *Calculi* in kidneys and bladder, mineral waters, 358. *Chronic diseases*, milk cure, 250. *Cystitis*, 359; associated with gout, 359. *Gravel*, mineral water health resorts, 356, 358. *Hemoglobinuria*, paroxysmal, associated with syphilis, 355; climatic treatment, 355; from malarial diseases, 355. *Nephritis*, chronic interstitial, climatic treatment, 355; in gouty subjects, 354. *Oxaluria*, mineral water health resorts, 357; sea-voyages, 357. *Phosphaturia*, exercise, 357; hydrotherapeutic treatment, 358. *Pyelitis*, chronic, and chronic catarrh of urinary bladder, climatic treatment, 358; milk cure, 320. *Renal disease* associated with pulmonary tuberculosis, 354. *Urethral stricture* and chronic gonorrhea, Willdungen, 359. *Urethritis*, chronic, and sequelae of gonorrhea, hydrotherapy, 359; mineral water health resorts, 359; sea-voyages, 359; gouty, 359
 Urinary system, diseases, waters, Cambridge springs, 125; system, diseases, waters, Waukesha, 163
 Urticaria, chronic, climatic treatment, 386
 Utacamund, 35
 Utah, 167, 188
 Utah Hot Springs, 186

V

Vaal River, 28
 Valley of Virginia, 128; Rousseau, 73
 Valparaiso, 52
 Vals, 358
 Vancouver Island, 189
 Vassar College, 217
 Vedado, 60
 Venice, 301, 367
 Vera Cruz, 222; yellow fever at, 222
 Vermont, 96, 98
 Verruga in Peru, 50
 Vesical calculus, waters, Farmville Lithia Springs, 129. See also *Urinary Organs, Diseases*.
 Vichy, 205, 206, 353
 Vicksburg, 148
 Vidago, 356, 358
 Vilcamayo Valley, 56
 Villeta, 61
 Vinal Haven, 40
 Vineland, 110, 120
 Vineyard Haven, 93
 Vineyard Sound, 91
 Virchow, 289
 Virginia, 78, 108, 128, 139
 Virginia Beach, 108, 270
 Virginia Magnesia Lithia Springs, 130
 Virginia Waukesha Lithia Springs, 130
 Visceral disease, Wellington, 36
 Viti Islands, 48
 Volcanoes, Hawaiian, 224
 Voland, 321
 Voyage from New York to Bermuda, rough, 76
 Voyages, sea, in arthritis deformans, 299; asthma, 337; bronchitis, chronic, 328; depression, mental, 367; diabetes, 268; emphysema, pulmonary, 339; hay-fever, 312; headache, chronic, 377; impotence, 361; insomnia, 373; old age, 301; oxaluria, 357; scrofula, 324;

tuberculosis, pulmonary, 305, 306, 308, 311, 315, 317, 319; urethritis, chronic, and gonorrheal sequelæ, 359

W

- Wagenaars Kraal, 27
 Waha, 179
 Wales, 190
 Walker's Pond, 97
 Walla Walla, 200, 201
 Walnut Grove Lake, 183
 Walshe, 311
 Walters, Dr., 173
 Walther, Dr., 258
 Waring, Colonel, 69
 Warm Belt, Santa Clara Valley, 195
 Warm Springs (Ga.), 140
 Warm Springs (Va.), 131
 Warm zone of Mexico, 219
 Warmbad, 29
 Warwick, 42
 Washington (D. C.), 108, 126, 127, 128, 210; schools of, 216
 Washington (State), 78, 199; table of temperatures, 200
 Washington and Lee University, 218
 Washington Memorial Institute, 216
 Washington Springs, 132
 Watch Hill, 94, 95
 Waters, Buena Vista (Pa.), 125; Cresson, 125; Glen Summit, 123; Le Roy, 184; Poland, for diabetes mellitus, 95; Poland, for renal diseases, 95; San Diego de los Baños, 70; Texas, irritating to bowels, 149
 Waters, acid, Lake County, California, 198. **Acid chalybeate aluminous**, Bath Alum Springs, 131; Bedford Alum, Iron and Lithia Springs, 131; Rockbridge Alum Springs, 131; sulphureted, Devil's Lake, 166
 Waters, alkaline, Rock Enon Springs, 130; Wilhoit Springs, 199
Alkaline chalybeate, Colemanville Mineral Springs, 129; Massanetta Springs, 130; Napa Soda Springs, 197; Fauquier White Sulphur Springs, 130
Alkaline earthy, Bentley's Springs, 127; Chattolbanee Springs, 127; Colemanville Mineral Springs, 129; Flint Stone Springs, 127; Gettysburg, 126; Glenn Springs, 139; Harris Lithia Springs, 139; Hot Springs (Ark.), 154; Hot Springs (N. C.), 137; Hot Springs (S. D.), 166; Minnequa, 124; Mudlavia, 159; Old Sweet Springs, 133; Palmyra Springs, 162; Shealtiel Mineral Springs, 164; Perry Springs, 163; **earthy chalybeate**, Adams County, Ohio, 158; Akesion Spring, 153; Nye Lithia Springs, 132; Schooley's Mountain, 121; Sweet Springs, 153; Waukesha, 163; **earthy muriated**, Allouez Mineral Springs, 163; Fountain Park Magnetic Spring, 158; Strontia Spring, 127; **earthy sulphated**, Bedford Springs (Pa.), 125; Holston Springs, 133; Hot Springs (Va.), 130; Montgomery White Sulphur Springs, 132; Potash Sulphur Springs (Ark.), 155; Washington Springs (Va.), 133; Salt Sulphur Springs (W. Va.), 133; **earthy sulphated chalybeate**, Buckingham White Sulphur Springs, 132; Cedar Bluff Sulphur Springs, 132; Iron Lithia Springs (Va.), 132; **earthy sulphurous chalybeate**, Blue Lick Springs, 153; Medical Lake, 201; **earthy weak**, Capon Springs, 134
Alkaline muriated, Magnesia Spring (Ill.), 160; New Zealand, 46; Stryker Mineral Springs, 158; Sulphosaline Spring (Ohio), 158; Topeka, 155; **muriated sulphurous**, Borland Mineral Well, 134
Alkaline saline, Fountain Geyser, Yellowstone Park, 184; **chalybeate**, West Baden Springs, 159; **sulphurous**, Klamath Hot Springs, 198
Alkaline, strongly, Bath Spring, unsuitable for drinking, 159
Alkaline sulphated, American Carlsbad Springs (Ill.), 160; Artesian Well, Louisville, 156; Genda Springs, 155; Harrodsburg, 156; Black Barren Mineral Spring, 126; **sulphureted**, Jordan's White Sulphur Springs, 130
 Waters, alum, Lake County, California, 198; alum, Mississippi, 148; alum, Virginia, 123, 131
 Waters, antacid, diuretic, Bowden Lithia Springs, 139; antacid, laxative, Allouez Mineral Springs, 163
 Waters, arsenical, Topo Chico, 221
 Waters, boiling, Rosseau Valley, 74
 Waters, brine, Erckenbrecker's Salt Well, 159; brine, dense, Great Salt Lake, 186; brine, strong, Mt. Clemens, 161; Sheboygan Mineral Well, 163
 Waters, bromin, Bowden Lithia Springs, 139
 Waters, calcareous, Aurora Saline Springs, 199
 Waters, chalybeate, Bedford Springs, 125; Lake County, California, 198; Mi-ni-yan Springs, 160; Mississippi, 148; Morganton, 136; **arsenical**, Mardela Springs, 127; **carbonated**, Sparta Mineral Wells, 163; **strong**, Berkeley Springs, 134. See also *Alkaline*, etc.
 Waters, diuretic, cathartic, Beck's Hot Sulphur Springs, 186; diuretic, Fauquier White Sulphur Springs, 130; diuretic, laxative, diaphoretic, Montgomery White Sulphur Springs, 132; diuretic, mild, Bowles Spring, 159
 Waters, earthy, Nye Lithia Springs, 132. **Earthy chalybeate**, Aurora Springs (Mo.), 153; Cambridge Springs, 125; Hunter's Pulaski Alum Springs, 123; Richfield Springs, 117; Sweet Chalybeate Springs, 131; **weak**, Berkeley Springs, 134. **Earthy sulphated**, Bedford Springs, 125; Clifton Springs, 117; Sheboygan Mineral Well, 163; **chalybeate**, Yellow Sulphur Springs, 132
 Waters, gaseous alkaline chalybeate, Cloverdale Lithia Spring, 126; Highland Springs, 198; **earthy**, Farmville Lithia Springs, 129. **Gaseous alkaline earthy sulphureted**, Buffalo Lithia Springs, 129; Catoosa Springs, 140; Gilroy Hot Springs, 197; Healing Springs, 131; Red Sulphur Springs (W. Va.), 133. **Gaseous alkaline muriated**, St. Clair Springs, 161. **Gaseous alkaline sulphureted**, Milboro, 131; Roanoke Red Sulphur Springs, 131. **Gaseous chalybeate**, Rawley Springs, 130; Roanoke Red Sulphur Springs, 131. **Gaseous earthy sulphureted**, Bedford Springs, 125; Blue Ridge Spring, 131; Warm Springs (Va.), 131; **chalybeate**, Check's Springs, 139. **Gaseous iodo-alkaline**, Glenola Springs, 12. **Gaseous muriated sulphureted**, Blue Lick Mineral Springs, 155. **Gaseous sulphurous**, Clifton Springs, 117; **chalybeate**, Cold Sulphur Springs, 131; thermal, Glenwood, 178
 Waters, hot, Boise City, 179; hot, Idaho City, 179; hot, Pony, 185. **Hot alum**, Lake County, California, 198. **Hot mineral**, Agua Caliente, 182; Canon City, 177. **Hot sulphur**, Banff, 84. See also *Waters, Thermal*.
 Waters, lime, western Texas, 149
 Waters, lithia, Bedford (Va.), 131; Buffalo (Va.), 129; Crockett, 132; Daggers, 131; Farmville, 129; Gettysburg, 126; Londonderry, 356; Mudlavia, 159; Otterburn, 129; Powhatan, 129; Virginia, 130
 Waters, mineral, Adams County, Ohio, 158;

- California, 197; Cambridge Springs, 124; Charleston, 142; Illinois, 160; Manhattan (Kan.), 155; Mount Clemens, 161; Mississippi, 148; Missouri, 153; Quetame, 61; Rangeley Spring, 96; Saratoga, 113; Villeta, 61; Waha, 179; Waukesha, 163; Yellowstone Park, 184. Mineral chalybeate, Pyrmont, 271; Schwalbach, 271; Spa, 271.
- Waters, muriated, New Zealand, 46. Muriated chalybeate, Green Lawn Springs, 160. Muriated, earthy sulphureted, Addison, Sulphur Springs, 134; St. Clair Springs, 161. Muriated sulphurous carbonated, Pluto Spring, 159; medium strength, Proserpine Spring, 159. See also *Alkaline*; *Gaseous*, etc.
- Waters, purgative, Crab Orchard, 156; LeRoy, 184.
- Waters, saline, Nelson County, North Dakota, 166; Pembina County, North Dakota, 166; Walsh County, North Dakota, 166. Saline chalybeate, Saratoga, 113.
- Waters, subthermal, Berkeley Springs, 134; Crockett Arsenic-Lithia Spring, 132; Old Sweet Springs, 133.
- Waters, sulphated chalybeate, Burkeville, 129; Rock Enon Springs, 130; sulphated earthy chalybeate, with hydrogen sulphid, Shannondale Springs, 134.
- Waters, sulphureted, Carlisle Springs, 126; Richfield Springs, 117; brine, Mount Clemens, 161.
- Waters, sulphurous, Akesion Spring, 153; Louisiana, 149; New Zealand, 46; Rock Enon Springs, 130; Sweet Springs (Mo.), 153. Sulphurous chalybeate, Greenbrier White Sulphur Springs, 134; Haywood Sulphur Springs, 136; Hubbard Springs, 133; Tennessee, 152. Sulphurous, hot, Santa Barbara, 193. Sulphur, iron, and lithia, Daggers Springs, 131. Sulphurous laxative, Indian Springs, 140. Sulphurous mineral, Yura, 56. Sulphurous saline carbonated, Carnelian Hot Springs, 198.
- Waters, thermal, Caledon, 26; California, 197; Durango, 222; Helouan, 19; New Zealand, 45; Saltillo, 221; Waterberg, 29; Yellowstone Park, 184. Thermal earthy sulphurous, Topo Chico, 221. Thermal muriated, Helouan, 19; Klamath, 198; alkaline, Old Artesian Well, 142; alkaline earthy, Castle Creek Hot Springs, 183; chalybeate, Helouan, 19; sulphated, Las Vegas Hot Springs, 169; gaseous alkaline, Klamath Hot Springs, 198; Utah Hot Springs, 186; sulphurous, Glenwood, 178; Helouan, 19; Klamath, 198; Salt Lake Hot Springs Sanatorium, 186; sulphurous chalybeate, Harbin Hot Sulphur Springs, 197. Thermal, simple, New Zealand, 46. Thermal or subthermal, Highland Springs, 198. Thermal sulphurous, Aliwal North, 28; chalybeate, Warm Springs (Ga.), 140; sulphureted, Platte Springs, 184. See also *Waters, Hot*; and the various *Hot* and *Warm Springs*.
- Watkins, 345.
- Watsonville, 196.
- Waukesha, 163, 345, 358, 374.
- Waumbek, 301, 333.
- Waupaca, 164.
- Wauwatosa, 164.
- Waynesville, 136.
- Weakness of the skin, 386.
- Weather stations, Puerto Rico, 74.
- Webb, Dr. Seward, 321.
- Webber Lake, 187.
- Weber, F. P., 281, 284.
- Weber, Sir H., 21, 261, 265, 304, 310, 320, 334, 335, 355, 363.
- Weilbach, 274.
- Wellesley College, 216.
- Wellesley Hills, 204.
- Wellesley Island, 109.
- Wellington, 36, 43.
- Wenatchee, 201.
- Wentworth Hotel, 90.
- Wernersville, 125, 301.
- Wertheimer, 292.
- Wesleyan University, 217.
- West Baden Springs (Ind.), 159.
- West End, 103, 104.
- West India Islands, 65, 77, 150.
- West Orange, 121.
- West Park, 115.
- West Point, 109, 115, 217.
- West Rock, 95.
- West Virginia, 117, 129, 133.
- Westbury, 102.
- Westerly, 95.
- Western Reserve University, 216.
- Westport, 301.
- Wallawatoola Alum Springs, 131.
- Whey in chronic bronchitis and pulmonary affections, 250; for prevention of uric acid gravel, 250. Cure, mineral water health resorts, 251; Allevard, 251; Appenzell, 251; Cauterets, 251; Gais, 251; Gérardmer, 251; Heiden, 251; Obersalzbrunn, 251; Reichenhall, 251; Reinerz, 251.
- Whipple Barracks, 179.
- White Haven, 123.
- White Mountains, 78, 79, 90, 96, 315.
- White Sulphur Springs (Va.), 150, 345.
- White Sulphur Springs (W. Va.), 370.
- Wiesbaden, 255, 290.
- Wildbad, 298.
- Wildbad-Gastein, 298, 370.
- Wildungen, 358.
- Wildwood, 103.
- Wilhoit Springs, 199.
- William and Mary College, 218.
- Williams College, 99, 216.
- Williams, Dr. C. T., 39, 51, 55, 311, 331.
- Williamsburg (Va.), 218.
- Williamsport, 124.
- Williamstown, 99, 216.
- Wilson, Dr. E. F. B., 28, 29.
- Wilson, Mount, 193.
- Wind, absence, central plateau of Mexico, 219; absence, Vilcamayo Valley, 56; north, Cairo, 18; northern, dry season, Los Angeles, 192.
- Winds at Hawaii, 230-232; at Hawaii, Kona, 232; at Hawaii, mumuku, 232; boisterous, New Zealand Straits, 44; boisterous, southwestern coasts of New Zealand, 44; chinook, eastern Washington, 200; chinook, Hot Springs (S. D.), 166; cold ocean, coast belt, California, 190; dry hot, northerly, of Australia, 39; effect of, on climate of San Francisco, 195; high, Colorado Springs, 177; high, Ojai Valley, 195; high, rare, Glenwood, 178; high, none, Salt Lake City, 185; hot, Adelaide, 39; hot, Melbourne, 39; hot, Riverina plain, 41; hot, disagreeable, San Gabriel Valley, 193; hot, northerly, Tasmania, 42; hot, less frequent at Sydney, 39; hot, less frequent in the Darling Downs, 42; hot, unknown at Brisbane, 39; khamsin, Egypt, 18; moderate, El Paso, 151; northeast trades, Havana, 68; northers, winter, Boerne, 150; northwest, winter, Florida, 146; strong, Nile voyage, 20; west and southeast, Wellington, 45.
- Windward Islands, 72-74.
- Winnabago Lake, 163.
- Winnemucca, 187.
- Winnipeg, 78, 80, 84, 85.
- Winnepocket Lake, 97.
- Winnipisogee, Lake, 97.
- Winslow, 119.

- Winter climate, clear, sunny, bracing, Pretoria, 29; climate intensely cold, Canada, 81; climate salubrious, James and Potomac Valleys, 128. Residence, Adirondacks, 110, 113; Aiken, 138; Arizona, 181; Assouan, 20; Atlantic City, 105, 106; Australian plains, 41; Bahamas, 72; Barbados, 73; Bermuda, 75; Brunswick (Ga.), 143; Cairo, 18; Camden (S. C.), 138; Cape May, 106; Charleston, 142; Check's Springs, 139; Citronelle, 152; Colorado, 173; El Paso, 150; Farmville, 129; Fayetteville, 135; Florida, 144; Glenwood, 178; Hamonton, 120; Helouan, 19; Hot Springs (Va.), 131; Idylwild, 194; India, 32; Kane, 124; Lakewood, 120; Las Cruces, 171; Las Vegas, 169; Liberty, 116; Los Angeles, 192; Luxor, 20; Mena House, 19; Montreal, 81; Morristown, 121; New Mexican resorts, 170; New Orleans, 215; North Carolina pine belt, 135; Old Point Comfort, 108; Pocono, 123; Richmond, 129; Roswell, 171; San Antonio, 150; San Diego, 190; Santa Barbara, 193; Santa Fé, 169; Sao Paulo, 58; Saranac, 111; Savannah, 142; Silver City, 170; South Africa, 24; Southern California, 190; St. Louis, 212; Summerville, 140; Tampa, 148; Thomasville, 140; Tucson, 183; Vineyard, 119; Virginia Beach, 108; West Indies, 65. Resorts for cases of chronic diarrhea, 347; for cases of chronic nephritis, 353; for cases of mental depression, 366; for the aged, 300, 301; for the anemic, 277; for the asthmatic, 334; for the bronchitic, 328; for the cachectic, 298; for the diabetic, 294, 295; for the pleuritic, 331; for the rheumatic, 287; for the tuberculous, 306-310, 319, 324, 325
 Winter Harbor, 88
 Winter Park, 147, 309
 Winternitz, Prof., 292
 Winters, cold, clear, North Dakota, 166; cold, dry, invigorating, Minneapolis, 165; cold, dry, invigorating, St. Paul, 165; mild, Baltimore, 126; mild, Catoosa Springs, 141; mild, Pacific Coast of United States, 188; mild, Richmond, 129; mild, sunny, Arizona, 180; mild, sunny, Yuma, 181; severe, northern slope of Ohio, 157; short, mild, Kansas, 155; short, mild, Nelson, 45
 Wiscasset, 123
 Wisconsin, 78, 162, 163
 Woman's College, Baltimore, 215
 Wood, Professor George B., 121
 Woodburne, 116
 Woodhall Spa, 361
 Wood's Holl, 91, 92
 Woodstock, 130
 Worcester, 98, 216
 Worth Lake, 146
 Wright, Dr. R. T., 34, 35
 Würzburg, 255
 Wynberg, 25
 Wyoming, 78, 167, 184
 Wytheville, 132
- X**
- Xeroderma pigmentosum, 384
- Y**
- Yale University, 95, 217
 Yarmouth, 91
 Yellow fever. See *Fever, Yellow*.
 Yellow Sulphur Springs, 132
 Yellowstone Park, 79, 184, 367
 Yeo, Burney, 349
 Yohannis, 356
 Yonkers, 115
 York Beach, 90
 York Harbor, 90
 Yosemite Valley, 367
 Young, the very, Block Island, Nantucket, and Vineyard Haven, 93; Hawaii, 241
 Yucatan, Peninsula of, 64
 Yuma, 78, 179, 180, 181, 182, 353
 Yura, 56
- Z**
- Zacatecas, 220
 Zell-am-See, 329
 Zonian Springs, 160

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